In This Issue—*What Are You Doing for Your Employees?*

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MOTOR AGE

Volume XL
Number 11

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CHICAGO, SEPTEMBER 15, 1921

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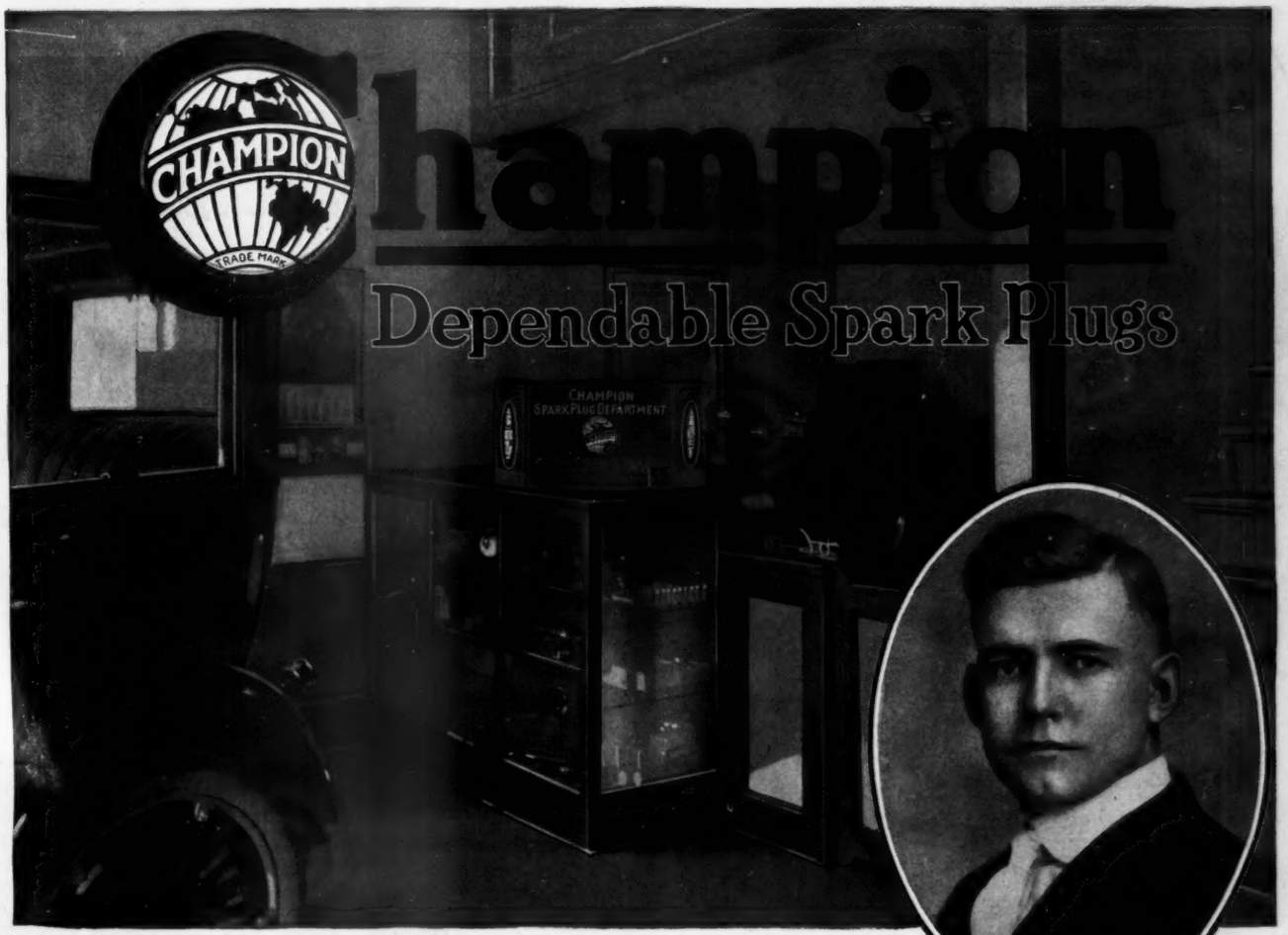

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Champion Spark Plug Co.,
Toledo, Ohio
Gentlemen:

We feel that your Champion Merchandiser is the best salesman that we have in our showroom, for we feel since we installed this that our spark plug sales have increased by more than double for the following reasons:

We have placed ours right on the counter where everyone can see it and have the index card lying right along the side and we find that in almost every case the customer will look the case over, look at the index card to see the style of plug his car uses, and if he has the least need of a spark plug at all, the sale is made.

We keep the case filled with Champion Plugs and find that along with the increase in plug sales our selling efforts have dropped off as much as our sales increased, on account of the case being a dandy silent salesman.

Yours very truly,
GILL AUTOMOTIVE SALES CO.
By (Signed) H. B. Gill, Mgr.

Independence, Ia.
May 3, 1921

Your Jobber Will Supply You.

CHAMPION SPARK PLUG COMPANY

607 Avondale Avenue — Toledo, Ohio

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TIP TOP TIPTON
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Does the Fussy Piston Jobs Without Fuss—

$2

Piston ring jobs are about the meanest you have in your shop. For the size of the job there is a terrible lot of trouble, breakage, waste of time and labor and material.

The Tipton Piston Ring Tool enables your mechanics to do these fussy little jobs without fuss. It elminates the danger of breaking or twisting rings and of injuring fingers. It stops the waste which has been coming out of your profits. It lets you do more work in less time.

The Tipton Piston Ring Tool is a two purpose tool.

The upper illustration shows it being used for its first purpose, putting on or removing rings. It takes any one-joint ring, which includes 95% of all rings. The claws are inserted at the cut and the long arms squeezed. This expands the ring uniformly until it slips easily over the piston either out of or into its proper groove.

The illustration at th eright shows its second use—cleaning carbon from the piston grooves. The specially hardened saw-edge of the long arm gets into the farthest corners of the groove and cleans out all the carbon in two or three turns.

With the Tipton Tool your men can take off a set of rings, clean the grooves **clean**, and replace the rings in the time they now take to do one of these operations. Isn't that tool worth $2 to your business on that count alone?

Regular Discount to Dealers and Jobbers

Made of Fine Tempered Steel

TIPTON MFG. CO.

TIPTON **IOWA**

MOTOR AGE

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING

59 East Madison Street, CHICAGO

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MOTOR AGE

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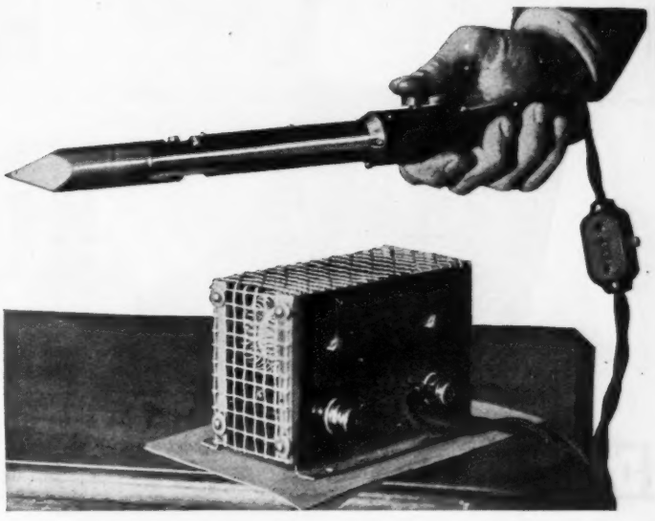
CARBON ARC
SODERWAND
"Solders Like Magic"



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The carbon arc, the most intense heat known to science, keeps the copper point at the right soldering temperature until the job is finished.

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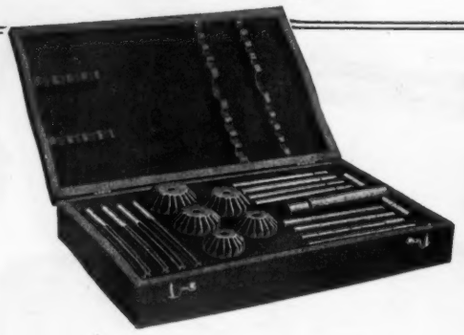
Send today for literature and prices. Baco is making money for others, it will do the same for you.

BACO ELECTRIC COMPANY
Bode, Iowa



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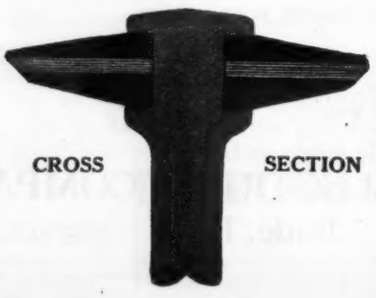
Expertly Designed to Do Perfect Work

Flexedge
VALVES You Never Need Grind

This famous valve now has a national reputation because of its remarkable performance. The head is made of laminations held tightly together between two heavy tapered plates.

As the valve head strikes the seat, the edges of the laminations are flexed about .001" which frees the seat of any carbon deposits. The result is a compression-tight seal always.

See your jobber.



CROSS SECTION

In designing these tools it was our direct aim to eliminate every fault known to valve tools and to include several exclusive features that are highly important in tools of this kind.

Note particularly the design of the cutter heads. There is an even number of teeth, half of which are cut radial with the center, each intermediate tooth being nearly parallel with the one preceding it. This design eliminates all chatter —a very important matter in recutting valve seats.

Particular attention has also been given to assure perfect alignment of the pilot and angle cutter—another very important feature.

A complete line of oversize reamers and pilots is included in the set. Very highest grade tool steel is used. scientifically hardened and tempered. Reamers, cutter heads and pilots are made in all sizes—standard, standard oversizes and special. The set illustrated will take care of the average garage or repairshop requirements.

Sold in sets or individually. Each tool fully guaranteed.

See your jobber or write for literature, prices and complete information.

THE SELF SEATING VALVE COMPANY
340 W. Huron St., CHICAGO

VOL. XL, No. 11 CHICAGO, SEPTEMBER 15, 1921 $3.00 Per Year

MOTOR AGE

Good-Will Your Biggest Asset

THE satisfied customer is the keystone of every business. Like the voussoir at the crown of an arch, which being the last stone to be set in place and which binds the whole structure together, the satisfied customer holds together the organization.

But let one of the stones in the arch crumble and the structure will topple, perhaps completely over. Likewise, let one unit of the dealer's organization break down and there will be a lowering of the keystone—the customer. The satisfied customer will think a little less favorably about the institution. Let several more departments fall down and the result is complete ruin.

That's what has happened in many instances during the past few years and probably will happen some more.

Every automotive establishment, big or little, will have to look over each unit of the business and make sure it is going to support the keystone, or they will step aside and let the rest of the parade go by.

What Are You Doing to Help Your Men?

Much of Present Grief Connected with Dealer's Business Can Be Stamped Out by Applying a Few Fundamental Facts. Cementing the Organization Together Essential

THOSE in the automotive business inclined to knock it—

Those who say, "there's no money in it and I'm going to get out as soon as I can"—

Those who wonder why the driving public refers to the service station or the garage as "gyps" and—

Those who are dissatisfied with the industry in general would do well to turn the spotlight on their own organizations and see how things are being handled.

Or, as the mechanic or greasehound might say, "how rotten they run things around here."

Not long ago we talked to a dealer who was handling two lines of good cars in a town of about 20,000 people. He was disgruntled with the business. He couldn't get good mechanics. He couldn't make his service pay a profit. He couldn't win the friendship of his customers. They came into his place with suspicion written all over their faces. He simply was not getting anywhere with his business. He wanted to get out of it. One thing he admitted, he was not running the place as it should be run and thought the best thing for him to do was to get someone that did know how. In other words, he was not an executive. He had not the knowledge of those subtle matters of organization required of an executive.

We went over to his place of business and it was not difficult to understand why he was not getting anywhere. First, there was the old "stand-by" of most institutions of that kind—dirt and grease. One could not step into the place of business for more than three feet without running the danger of getting all mussed up from a dirty post or risking one's neck by slipping on a floor that was once the color of new cement, but now had taken on the appearance of the inside of a transmission case full of gears and grease. Even if a customer never went any farther than through the door he would be suspicious of the proceedings about to follow.

TURMOIL IN SHOP RUINS DISCIPLINE

There was confusion on all sides. Repair work was going on in the front of the building. Men were yelling up the elevator shaft. It was one of those places you are glad to get out of as soon as possible. The dealer himself was a sort of cheerful fellow who would just as soon as not shake hands with a customer —even if his hands were dirty. Yet the men who worked for him seemed sullen and—judging from the expressions on their faces—evidently were provoked at the customers who brought in their cars for service. Teamwork was lacking. It was easy to see that the shop didn't care much whether the parts department hung together or not. All that the men were looking out for was to see that they got their pay checks on Saturday afternoon.

Why should they worry about overhead or policy?

Why should they care if Jones or Smith bought another car from their place.

That was something for the sales department to look out for. This establishment was full of turmoil. And, rest assured, it is not the only place of its kind.

But what to do? What to do?

First of all, what this dealer needed was someone to turn the spotlight into his place and show him the obvious things. Just because automobiles have to travel over muddy roads sometimes and just because oil and grease are necessary to the welfare of automotive vehicles—is no reason why filth has to stare one in the face the minute one enters a service station or garage. There is no excuse these days for such conditions.

It is safe to say that many a service station could increase its business right now if a few days were spent in cleaning up the place and rearranging matters.

We cannot hope to give concrete directions here as to what the dealer should or should not do. He must be able to stand in his place and look around for himself. If nothing else, he might start with washing the windows, scrubbing the floors and painting the walls a cheery color. There is enough gloom around the average service station without having to cast one's eyes on black and grimy walls. Even this much work will change the atmosphere of the place, and with it might come a reaction on the part of the men who have to attend to the customers' wishes.

WHAT MAKES ONE BUSINESS SUCCEED AND ANOTHER FAIL

But suppose we put aside the more obvious things and point out some of the more subtle things that make it possible for one business to succeed, while another business, without them, fails. **The best place to start is right with the men or women in the organization.**

We have repeatedly stated in these columns that everyone in the organization is a salesman or a saleswoman, from the greasehound away back in the shop, to the executive in the front office, who in the annals of the men in the shop or parts department, "has nothing to do but jolly the customer."

It is of the greatest importance that the dealer get every ounce of cooperation from the people who are working for him. But to get that he must do certain things. He must remember that they are the same human beings he holds himself to be. He must remember they get tired as he does—that they like to go to a movie theater as he does—that they would like to better their own standing in the organization just as he likes to better the standing of his business—that these men who work hard all day in the shop want to have their "kiddies" at home get an education just as he intends that his children should. And so on.

What is necessary in the vast majority of dealer establishments or service organizations is a correct presentation to every individual employed therein as to where he or she fits into the organ-

It Has Been Done Once—So Why Not Again?

NOT long ago a man who formerly was manager of an automobile business told us that he went through his organization from top to bottom with the idea of not only bettering the business, but making it more profitable for every one in the establishment.

He talked to the men individually and collectively. He showed them their place in the picture. He showed how a broken droplight meant money out of someone's pocket—how an unkind word to a customer or coworker in the place meant the building up of resistance—and many other things.

The result was that in the next year he had made it possible to double the pay of almost every one in the place and also for the service department to do several thousands of dollars worth of more business than the previous year. Much of all this was due to the fact that he talked to and worked with the people in the organization.

ization. The dealer himself, or whoever manages the place, should paint a clear picture of the business and show everyone how important he is to the picture. This was gone into at some length in last week's issue of MOTOR AGE.

HUMAN ELEMENT MOST IMPORTANT CONSIDERATION

What better work could possibly be done by a dealer than that of educating the men and women in the institution on such items as overhead, productive work, unproductive work, policy, etc.

The fact of the matter is, many of those who started in this business as mechanics, and who since have taken the agency for one or two makes of cars, perhaps, do not themselves know what overhead is. Much less can they determine between productive and unproductive labor. If you don't believe it just get together a crowd of dealers in an average sized town and ask them why they charge $1.25 for repair work. Most of them will answer that that is the charge customary for the work. Very few will say, labor, plus overhead, plus profit.

For years there has been a feeling in most automobile establishments that the boys in the shop, in the parts department, or on the service floor were not and could not be of the same caliber as those in the salesroom, as far as the individuals themselves were concerned. Naturally enough, the work in a shop or service department is vastly different from the proceedings that go on in a salesroom, but both are necessary.

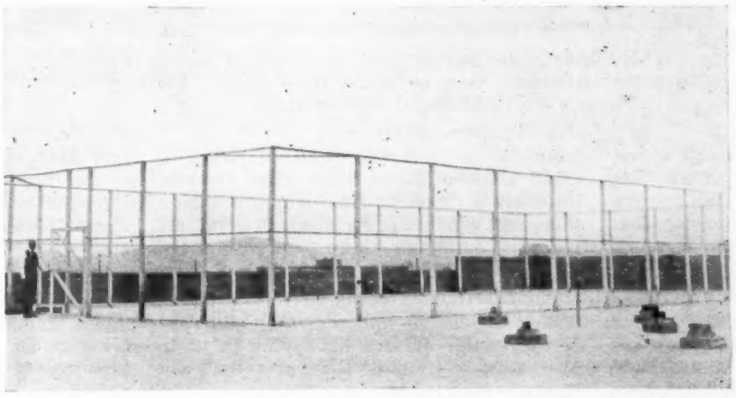
And right here the dealer can do some good work for the men in the shop or service department. Men have to wear work suits and these suits, because of the nature of the work, get dirty. They have to be washed at least once a week, sometimes oftener. If the men have to carry home their suits wrapped in a bundle under their arm and they see the salesmen going to their homes clad in good clean clothes, it is but to be expected that there is a not altogether pleasant feeling on the part of the shopmen towards the salesmen.

The dealer can help this situation materially by each week sending the suits of the shopmen to the laundry and charging it to overhead. The effect will be that the men will realize the management knows their work involves dirt and grease; that it is necessary in the fulfillment of the house policy towards servicing the customer's car, and that the house will do all it can to cut the unpleasant side of the work down to a minimum. It does not amount to much money at the end of a year to wash the men's shirts, and the returns gained by it cannot be measured in dollars and cents.

Take the matter of washrooms for the men. Too often a building is put up with fine showrooms, fine rest rooms for customers and office help—but anything will do for the men in the shop and service department! You never see the dealer washing up in the shop washroom, and yet at the outset of this article we said the men in the shop are just as human as the dealer, and like and dislike the same things he does. No one expects tile floors or marble washstands in the shop, but the men are entitled to facilities that will command respect for the institution.

Most establishments you go into these days have signs all over, such as "Turn Out Lights," etc.; yet when you walk into a basement storeroom or some such place, nine times out of ten you will find the lights going full blast and no one around. As a popular cartoonist would be likely to say, "the signs are great, but they don't mean much."

When the signs were put there it was done with the idea that overhead would be cut down if the men turned off the lights as soon as they were through with them. But overhead means nothing in their lives. The house pays that, so why worry? If the bill is a little high, what of it? There's enough money in the cash register to pay for it. And so on.



This tennis court on the roof of one dealer's building has done much to cement the organization together. Every man is for the institution

A GRAPHIC ILLUSTRATION THE MEN WILL UNDERSTAND

A method of dealing with this trouble is as follows: if the shop or parts department or any other department is the chief offender in the matter of wasting light, put the lights on a meter and have some responsible person check up on them and at the end of one or two months you will have a definite figure on the money wasted on lights burned unnecessarily. Then explain to the men that as overhead is cut down so will the profits climb, and as the profits climb so will the individuals prosper.

Suppose the offending department had in it 10 men and it was figured $20 was paid for wasted light. Ask the men if they each would not rather have had $2 added to their pay checks that month. On the other hand, deduct $2 from their pay and hear them holler.

In the same way the dealer should demonstrate the saving possible from close application of the principle of economy in the curtailment of long distance telephone calls, telegrams, heat, water, power, stationery and printing, the handling of supplies and the maintenance of company cars. The employee in the service station can influence every item of expense except rent and salaries.

MAN POWER MORE THAN A MECHANICAL FORCE

Weekly meetings of the men are a help. Even a meeting of foremen only and the dealer, at which details of the business are gone into, will help, as the information gathered there may in turn be imparted to the men under the various foremen.

Have a suggestion box for the men. It is surprising the excellent ideas received from the men in this way. In one instance where a suggestion box was used a mechanic expressed the thought it would be well for the foreman to distribute work in such a way that it would not become monotonous. This man had, for example, done nothing for three weeks but grind valves, and it was no wonder he was becoming weary of his work at the end of that time. Anyone who has ground valves knows what three weeks of it would be like!

This man was moved from the valve job to tearing down engines and gearsets. He took hold with renewed vigor. He naturally had gotten sick and tired of fussing with valves day in and day out for three weeks. Monotony of work is a thing every dealer should watch, or make sure the shop foreman watches.

A man may be an excellent mechanic. He may turn out work that is faultless, and yet he might be the most expensive man in the place because of careless, extravagant habits.

Some dealers have formed the excellent habit of calling the attention of the men to articles in the various trade papers devoted to the business. In one instance, the dealer has placed a bulletin board in the shop on which he places regularly the name of the paper, the title of the article, page, etc., he wants his men to read. The men naturally figure that it is up to them to read these articles, inasmuch as the dealer has done so and thinks the men should do so.

One California dealer has placed a tennis court and handball court on the roof of the building where the men hold tournaments. It cost money to do so, of course, but he is getting it back twofold in the pep the men are putting into their work. They are working for the organization. The courts afford an intermingling of shopmen with salesmen, parts men and greasehounds—and everyone is happy.

Service Is More Profitable Than Display To Country Dealers

How One Country Dealer Has Put Seventy-Five Trucks in His Territory and Sees to It That These Are Kept in Proper Working Order

A RECORD of selling approximately 75 motor trucks to farmers in the vicinity of Mount Prospect, Ill., has been made by Busse Bros. In building up this business, they have found that service is much more important than an attractive display. This idea was held paramount during the construction of their building; most of the building is service space. There is a small space for an office on one side of the front and a space large enough to display one truck on the other side of the entrance. Sometimes there is no truck in this display space, because the demonstration truck has been sold. But this does not worry Busse Bros., because they consider that the service end of the business is much more important.

This building was put up with the idea that service is much more important than an attractive display. Most of the building is service space

Albert Busse explains, "Our customers want their trucks in use just as much of the time as possible. A farmer requires his truck almost every day, and if it is not in working order, his neighbor finds it out very soon. Our problem is to keep these trucks in constant working order, so that the neighbors, seeing them, will want to buy one like them."

A good many of the customers in this vicinity are vegetable growers, and the principal use for their trucks is to haul vegetables to Chicago, some 25 miles away. Constant service is necessary in this particular line of farming. If a load of vegetables is put onto the truck in the afternoon, and then the truck refuses to go, the farmer stands to lose a good many dollars.

The plan of Busse Bros. is to catch the trouble in the truck before it really stops operation. This requires frequent visits to the farms of customers, and some little educational work. These service visits are made in connection with sales trips, and usually the service call results in securing some good testimonial, which helps make a sale on the next farm.

TRUCKS GIVEN PROMPT SERVICE

While passenger cars are handled also, preference is always given in the service department to the motor trucks. A passenger car can wait, but a motor truck must be on the road just as soon as possible.

By a careful study of the operation of the trucks in the territory, Busse Bros. have found that they can maintain a small stock of parts which does not run into much money, but which enables them to render prompt service on all trucks. Although there is a big store of parts in Chicago, which is less than an hour's ride by train, they find that it is less expensive, and that they can render prompter service by having in their own garage some of the parts that are likely to be needed.

Overhauling work is encouraged during the winter months. Because of the frequent visits to customers, it is usually possible to get each customer to have the truck overhauled every winter. If none of these visits were made, it would be more difficult to accomplish it, because the farmers would not be so well acquainted with the dealers, nor would they appreciate the importance of such service.

SERVICE TRIPS ARE MADE BY PROPRIETORS

These service trips are made by one of the proprietors; unless some unusual amount of work is necessary, this is the rule. In case something requiring more work is discovered, either the truck is taken into the garage, or else one of the repairmen is brought out to the farm. It is usually possible, however, to take the truck into the garage.

These trips are really trips of inspection. If the truck does not happen to be home when Mr. Busse visits the farm, he questions the owner, and usually is able to get a pretty good idea of the working condition of the truck. If the truck is there, he goes over it quite thoroughly, making suggestions to the owner as he proceeds.

No effort is made when the truck is sold to promise any definite amount of service for the purpose of making the sale, but inspections are made just the same, and are made quite regularly. Some dealers promise a certain number of inspections at regular intervals, then, if the inspector is not there at the appointed time, the customer is inclined to be disappointed and he loses confidence in the dealer. The Busse plan is to surprise the customer by giving him an inspection that he is not expecting. When this plan is followed, no harm is done if the inspection is not made at exactly the same interval each time, and thus the cost of making the inspection is almost entirely fused into the expense of selling.

"We don't have to do a great deal of arguing," says Albert Busse, "when we find a farmer who is really in the market for a motor truck. We simply talk with him about the experience some of his neighbors have had with our truck and our service. We never mention such a thing as free service, but talk about the facilities we have for repairing his truck promptly in case anything should happen.

"Farmers all understand that something is likely to happen to a motor vehicle at any time, and they care more about a prompt repair of the trouble than they do about the cost. I have never had a farmer complain yet on the cost of the repairs, but when they bring their truck in the morning and it is not ready in the afternoon, we certainly hear from them. I don't blame them for this, because a farmer's work is such that he must have his equipment in use all of the time, if possible.

"I believe that my brother and I appreciate this much more than we would if we stayed in our shop all the time. While we do some of the repairing ourselves, in order to keep in close touch with the trouble coming up, we spend the largest share of our time out on the farms visiting with our customers and helping them in any way we can. Occasionly we find a demand for an extra truck to help out with some certain work. We usually are able to arrange for this extra truck to help out. Then again, we take one of our own trucks and do the helping ourselves. This is done partic-

ularly when the job is not a very long one.

"I have never known a case yet where I felt that the time spent was of no value except to help out the customer. We practically always, by this demonstration, have an opportunity to gain at least the good-will of some other prospect, and usually we actually make a sale, sometimes selling the very truck we are using to help out the customer."

"I think this sort of service ought to be included in the general term "service" we talk about so much. Most garagemen seem to think that service is nothing but repair work, but to my mind it means helping the customer keep his work going on schedule time.

SOME PACIFIC COAST IDEAS THAT HAVE HELPED THE AUTOMOBILE BUSINESS

THE executives of the William L. Hughson Co., Ford and Federal truck dealers in San Francisco, believe in the importance of the employee in the general business plan. Many features have been planned to make his work more pleasant, his condition more enjoyable and his recreation time more beneficial.

Private steel lockers are provided for every employee; showers and washrooms are large, pleasant and well lighted; a large glassed-in room on the roof, called the democracy room, provides a meeting place; an up-to-date miniature hospital with all facilities to give first aid is provided; a gymnasium is specially equipped for their benefit; two handball courts and a tennis court on the roof provide additional recreation features. Parking space is also provided for employees' cars on the roof and ramps, wide enough to permit machines passing each other, and provide easy access from the ground to the roof.

The showrooms of the Ford cars and the Federal trucks are entirely separated and are under the supervision of separate department heads and sales managers. The parts and service departments are also on different floors and under the supervision of experts.

Two public gas stations are on the Eleventh street side, and the entire basement is devoted to a day-and-night garage, where Ford service is rendered.

This company has one of the best equipped motor car merchandising and service buildings in the country. Ideally arranged for the solving of the service problems of Ford owners and for caring for the needs of Federal truck users, it also affords excellent showroom for the proper display of cars and trucks, and provides the most modern facilities throughout for the carrying out of the most up-to-date merchandising methods.

A three-story structure with a large basement and with the roof also utilized, it provides for a total space of 133,000 sq. ft.

Wide Entrances Help Business

NOTHING is so discomforting to a car owner as to have to remain outside of a service building or garage amidst other motorists, all of whom are trying to crowd through a narrow doorway.

In the newer buildings, of course, the dealer generally has seen to it that entrance ways are made sufficiently large, but even here sometimes we find instances where more space could have been given to doorways.

One of the first features of the Palace garage in San Francisco, Calif., to attract attention is the wide entrances. They are too large to be called doorways; there is absolutely no chance of blockades or delays on cars entering or leaving the garage and no danger of cars running into each other, as there is plenty of room to turn.

Another novel feature is the fact that there are two service elevators connecting up the various floors, from basement to roof.

There is a chauffeur's room, equipped with washroom and showers for the use of drivers, and above these quarters on the mezzanine floor is a handsome, completely furnished dressing room for women.

An ingenious telephone system permits the help to communicate with one another quickly, which greatly contributes to efficiency.

The main floor of the garage is devoted to offices at one end, while the main body of the floor is used for car inspection and temporary parking. On this floor there are double washers where two cars can be washed or greased at once. There are also double washers on the roof.

SOME FACTS ABOUT SERVICE

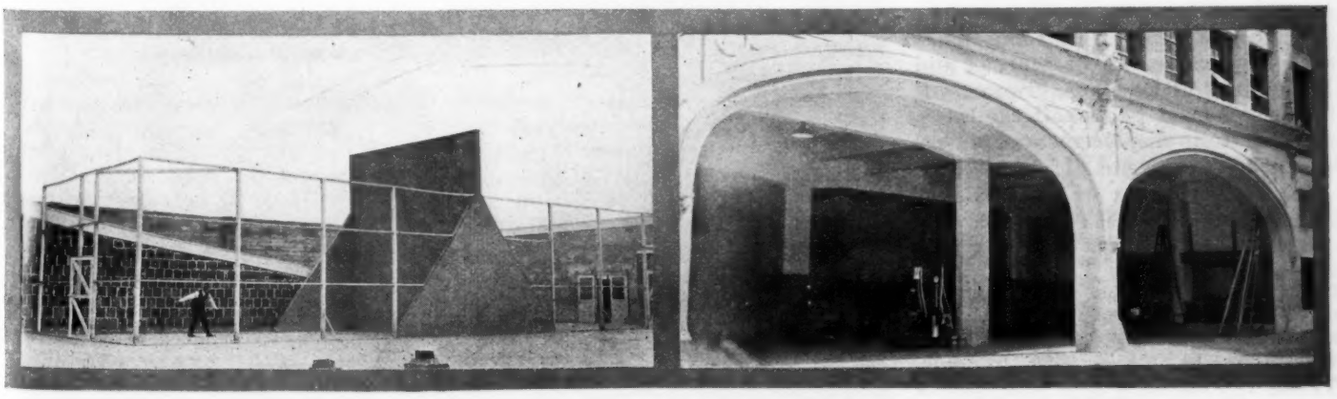
1—Service varies greatly. No two dealers have an identical plan.

2—Plans for service may generally be classified as follows:
- (a) No free service at all. This class is very small.
- (b) Well defined plan. This class includes quite a number employing service cards, agreements and other forms.
- (c) Very elastic plan, or possibly no plan at all. There are a great many in this class. Their service is given according to judgment. They endeavor to give as little as possible, but, lacking a well defined plan, generally give much more than they originally intended.

3—Free service reduces profits to an alarming extent.

4—All dealers desire to see some definite solution of the problem.

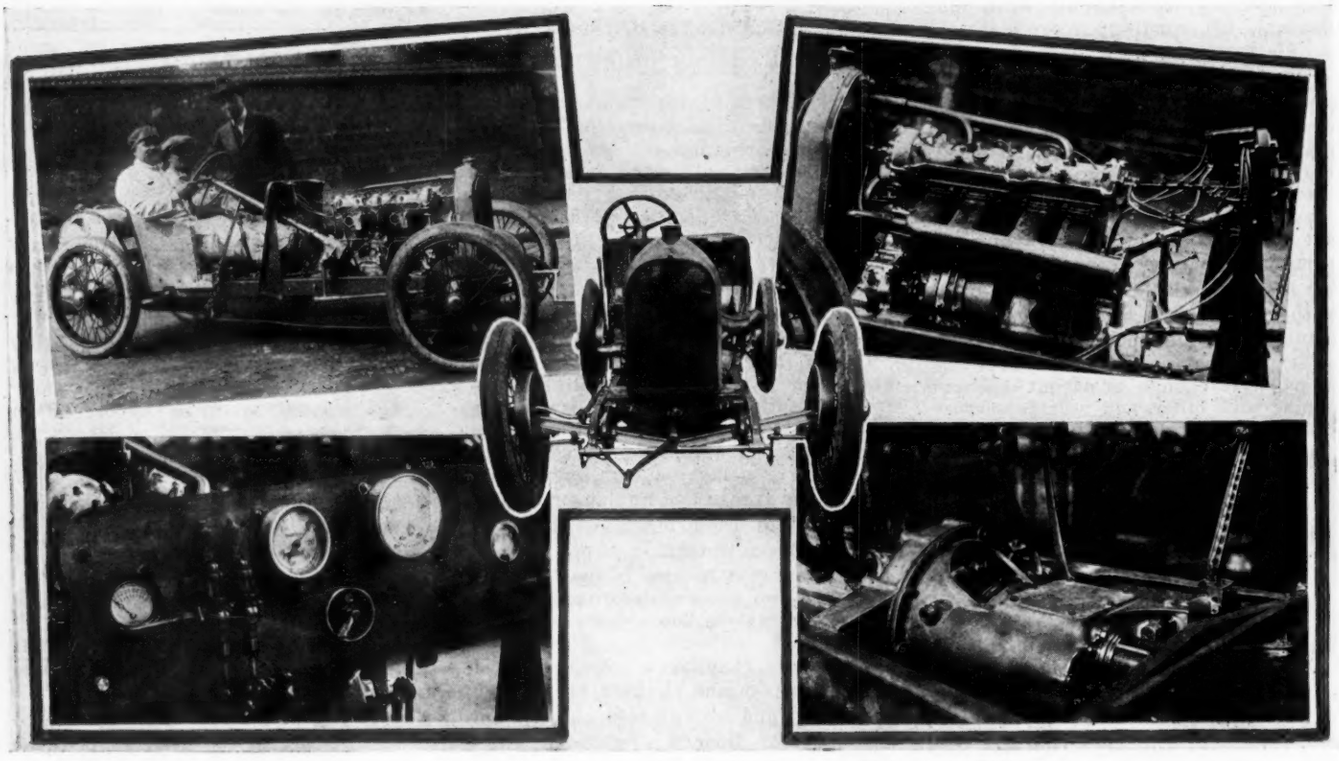
5—Some free service must be given. It should not be eliminated for two reasons:
- (a) The public has been educated to expect some degree of free service.
- (b) The dealer needs to give some free service in order that he may keep in touch with the cars he has sold until he is sure the owner is familiar enough with the car to secure satisfactory operation.



Two ideas worth bringing to the attention of dealers and service stations. Left—A handball court for the men on the roof of the William L. Hughson Co., San Francisco. Right—Wide entrance way of the Palace garage in the same city.

Two Small Car Races In France This Month

Possible to Produce Light Cars, Speed of Which Is Not Limited by Roadability. Some Cars Can Do 85 Miles Per Hour on Open Road



Some views of the Talbot-Darracq 91.5 cu. in. racing car to be piloted by Rene Thomas at LeMans, France, September 16 and 17. The engine of this car has an aluminum block with steel liners. Delco ignition is used. The engine runs up to 4,000 r.p.m. and is declared to develop a little more than 50 hp. at this speed

PARIS, Sept. 1—Races for cars of small piston displacement and low weight are becoming so increasingly popular in Europe that even the 183 cu. in. limit cannot be expected to remain in force more than another year. On Sept. 17 and 18 the town of Le Mans, France, will be the scene of two small car races, with piston displacements of respectively 67 in. and 91.5 in.

The smaller class is for machines coming under the European definition of a cyclecar, these having a total maximum piston displacement of 7 in. with a minimum weight of 551 lbs. and a maximum of 771 lbs. These machines must carry a driver and mechanician who need not necessarily be placed side by side. Twenty-two machines have been entered in this class. While the types comprise single, twin and four-cylinder engines, with various classes of transmission, the

By W. F. Bradley
(European Correspondent, Motor Age)

tendency in France is towards four-cylinder water-cooled engines, with normal type gearbox and bevel driven rear axle.

In the 91.5 class the generally accepted lines of car construction are always followed, but as the maximum weight is 1146 lbs. empty, very careful designing has to be carried out to get the car within the rules. In this class the rules stipulate that driver and mechanician shall be carried side by side.

SUSPENSION AND BALANCE RETAINED AT HIGH SPEEDS

These little racing cars are equal in quality and finish to the big cars which have hitherto attracted the attention of racing enthusiasts. Only a few years ago these small machines were somewhat disdained by reputable manufacturers, but now they are attracting the attention of the very best manufacturers, for there are few European firms not interested in the production of a stock car having an engine varying from 90 to 100 cu. in. piston displacement.

Probably the most difficult problem to be solved is that of suspension and balance of the entire chassis at high road speeds. Admittedly, it is much more difficult to get the same riding ability with a car totaling only 1200 lbs. as with one twice this weight, but Bugatti and others showed in last year's race that it was possible to produce a light car the speed of which was not limited by its ability to hold to the road. Some of these cars are capable of 85 m.p.h. on the open road, at which speed they sit down as steadily as a big car of twice the weight.

Among the big firms participating in this year's light car races is the French

Talbot-Darracq Co., with three special 91.5 cu. in. racers of unusually high merit. So far as the engine is concerned, advantage has been taken of the drawing office work done on the eight-cylinder-in-line three-litre racing jobs, the cylinder blocks being interchangeable with those on the bigger cars.

Dimensions of the four block cast cylinders are 2.55 by 4.40 in. bore and stroke. Aluminum is used for the cylinder casting, with steel liners and bronze seats for the four valves inclined in the head. The engine has three plain bearings, with a circular web balanced crankshaft and very small flywheel. It runs up to slightly over 4000 revolutions and is declared to develop a little more than 50 hp. at this speed.

WEIGHT SAVED BY DIRECT ATTACHMENT

While the big engine is carried in a three-point suspended subframe, the four-cylinder job is directly attached by four points to the main frame members, thus eliminating a certain amount of weight. Delco ignition is fitted, with the distributer driven off a vertical shaft on the righthand side of the engine, between the two carbureters. The double oil pump is driven off the base of this shaft, and takes oil from the reserve tank in the chassis and delivers it to the main and connecting rod bearings. The second pump returns the surplus oil from the base chamber to the feed tank.

The four-speed gearbox, comprising the bell housing for the multiple disk clutch, is bolted directly to the rear face of the engine crankcase. The change speed lever is on an extension of the box, and is thus independent of the frame members. Drive is through an open propeller shaft with a plunger joint at the forward end and a ballbearing star joint at the rear, the underslung rear springs being on the Hotchkiss principle.

Rear axle housing consists of two steel forgings, machined from the solid, with an aluminum center. No differential is fitted. Brakes are applied by pedal to all the wheels. At the front the mounting is on the Isotta-Fraschini principle, with the brake camshaft mounted on the under side of the front axle. Brake drums are machined with radiating fins, and receive aluminum shoes. The side lever controls a set of brakes on the rear wheels only. With a track of 43 in., a wheelbase of 96 in., wire wheels and tires of 28 by 3½ in., the racing car comes well within the weight limit of 1146 lbs. Straight side tires are not being used on these small sizes.

Most of the cars running in the French 91.5-in. class will also take part in the 200-mile race to be held on Brooklands track during the month of October. This is the first race of its kind to be held on the English track.

Side Lines Fill Profit and Time Vacuum

IN many lines of business it has been found that extra dollars can be rung up on the cash register if the proprietor will study the wants and habits of his regular line patrons and put in sidelines that harmonize. Some garagemen and automobile agencies are learning this fact.

In southern California there is a large motor agency which is built in an "L" shape so as to have an entrance on each of two of the streets of the town. In the angle of the "L," located on the corner, is an oil station operated by the agency. It does a thriving business; but oil stations in such agencies are not uncommon. There is one feature, however, that is unusual and that is the refreshment stand located in one-half of the oil station, with a separate entrance of its own.

The building for the station is clean and unique in design. The fountain is small and there are several stools and a table for travelers. This feature adds to the profits and improves the atmosphere of the place. Package confectionery is also carried here.

In the photograph accompanying is shown the way in which the man who handles the parked cars of one firm puts in spare time and increases his earnings for the firm. There is a newsstand at the entrance to the parking enclosure. It shelters the watchman and shows his wares. Here people not only transact business in connection with parked cars, but talk terms on secondhand cars that are on show there.

A line of road maps of the surrounding country with information free when it can be given verbally, is the side line of another office. This service acts as a magnet and helps pay its own way.

A refreshment and newsstand which adds to the profits of one motor concern

DISPLAY CASE SHOWING CAMPING EQUIPMENT INTERESTS CUSTOMERS

In one place a fine display case on the floor in the center of the salesroom shows needs of campers and travelers, such as thermos bottles, luncheon kits, camping stoves and the like. In some cases these are sold right along with the car.

Camera films, flashlights, drinking cups and a hundred and one other small items appealing to motorists are in the case in another establishment, thus reminding them of the need of such goods.

A peculiar side-line that is handled successfully because of the ability of the owner, is job printing of a cheap grade done by a repairshop. The job press is run by the same power that drives the other equipment. The owner does his own forms and advertising matter—he is a heavy user of hand bills and other cards which he regularly places in machines parked along the street—and he does outside jobs for profit from time to time.

Make Your Title Tell Your Methods

NAMES often indicate character. Just as we visualize persons we have never seen by their names so are we inclined to draw an imaginary picture of a place of business or an organization by the title the proprietor has bestowed on it. The name Dr. Slaughter for a surgeon does not raise our regard for his ability. This may sound like silly prejudice, to be sure, but nevertheless the expression has been unconsciously unfavorable and may affect our opinion.

This bit of psychology may well be kept in mind when choosing a name for a garage or repairshop. The title can be made merely a label or with thought can be made to carry a message of confidence in your methods and organization.

You, perhaps, can think of a better name, but by way of suggestion we offer the following:

"Goodcare Garage."
"Sincere Automobile Service Co."
"Rite-Rate Garage."
"Servewell Service Station."
"The Livewire Garage."
"Economy Service Co."
"Day-and-Nite Garage."
"Security Service Co."
"Attention Garage."
"Dynamic Service Co."
"Quick-Service Garage."

Some Pertinent Facts on Cylinder Grinding

When It Is Necessary to Regrind Cylinders—Important That Engine Be Properly Assembled After Cylinder Work Has Been Done

MANY of the larger automobile repairshops have taken up the work of cylinder regrinding and can, therefore, do an entire job of overhauling under one roof. It also has been shown that quite a virgin field presents itself in the smaller shops, because on a small investment they often can place themselves in the class with the larger shops. Many of the small shops are fully equipped with the exception of a grinder.

In order to assist those about to enter the regrinding business, the Heald Machine Co., Worcester, Mass., has recently brought out a book covering every phase of the business. There is much that the average shopman does not know about cylinder regrinding, and in order to better acquaint him with the subject we present herewith some excerpts taken from the book.

No one knows so little about cylinder regrinding as the average motor owner. The manufacturers have long since recognized this as the best method of finishing cylinders. Many of the repairmen advocate it; but to the owner it still means an unnecessary operation—only another way to add a few more dollars to his already overtopped garage bill.

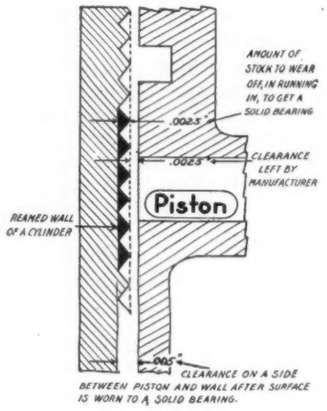
It is, however, so vitally important in helping the engine to function properly that careful thought and study should be given it by every driver.

It is essential, to have an engine run properly, that the cylinders be reground so that they do not vary more than a .001 in. as to roundness; and the hole must be straight and absolutely square with the base of the cylinders; otherwise there will be a noticeable loss of power and pep, excessive use of gas and oil, piston slap, continual fouling of the spark plugs, and general troubles of all kinds.

COMPRESSION

It is necessary that a cylinder bore be straight and round to obtain the proper compression. You cannot fit a ring and have it tightly seal a cylinder with an unround hole or one which has been enlarged in the top, either by error or inaccurate machining. Compression means a live engine, and rings must fit the hole.

When an engine has lost its compression, knocks on the hills, etc., the owner usually makes the mistake of trying to cure the trouble by enriching his mixture. While this will temporarily cure the trouble, an excess of raw gasoline in


AMOUNT OF STOCK TO WEAR OFF, IN RUNNING IN, TO GET A SOLID BEARING
.0025
.0025
CLEARANCE LEFT BY MANUFACTURER
Piston
REAMED WALL OF A CYLINDER
.005
CLEARANCE ON A SIDE BETWEEN PISTON AND WALL AFTER SURFACE IS WORN TO A SOLID BEARING.

Enlarged view of cylinder wall, showing how half of bearing surface is lost, due to depression of metal between each hill

the cylinder, on the compression stroke, is forced past the rings, thinning the oil and destroying its lubricating qualities and possibly resulting in scored cylinders.

This gasoline eventually reaches the crankcase, where it thins the oil to such a degree it is useless as a lubricant. Old and worn cylinders are not the only instances where this happens, as it also occurs in many motors where the holes were not originally ground, but were inaccurately bored or reamed.

Thus not only is excess gas being used in proportion to the power secured, but a large share of oil is going off in smoke, or is being rendered useless, thus requiring constant renewal.

Ill-fitting rings not only allow leaking of gas, but on the suction stroke air is sucked up from the crankcase, thinning the mixture and causing the engine to skip. This is particularly noticeable when traveling at idling speeds or starting on cold mornings.

When the oil gets by the piston rings into the combustion chamber and is burned by ignition, it gives off a bluish smoke, leaving carbon formed on the head of the piston and in the compression chamber.

Carbon holds heat and if the compression is high, it will often explode the mixture earlier than it should. This is called pre-ignition and very often results in a broken piston pin, bent connection rods, or a scored cylinder. Of course, burnt oil soots the spark plugs and requires constant cleaning to keep a hot spark.

There is nothing more aggravating to the driver than to have his engine knock. Some engines have such a thick carbon deposit that the slightest pull will result in this annoying sound. This condition is all caused by oil leaking past the rings into the combustion chamber, where it is burnt by the ignition.

WHEN TO GRIND

Cars that do not run tight, that use an excessive amount of gas or oil, lack power or pep, or smoke, need overhauling. A disagreeable piston slap is a sure sign of worn cylinders. This is usually heard on hills or when the engine is laboring hard.

After it is taken down, it can best be determined whether it needs to be reground or not. If found scored, out of round, or with excessive clearance between the piston rings and cylinders, they certainly need regrinding.

All cars that have been run two or three years should be pulled down, reground and fitted with new pistons and rings.

If the cylinders have been welded for any purpose, such as a score or a crack, they must be reground. Welding distorts and changes the shape, in addition to leaving excess metal. Only by being reground can it be brought back to a true, round, smooth hole.

With commercial cars or tractors, the same reasons for regrinding hold true as with passenger cars. They are usually worked constantly to their full capacity and are required to perform tasks which require every ounce of power.

Tractors, in particular, are subject to excessive wear, due to the conditions under which they must work and the dust and dirt working into the engine. Regrinding should be done at least once a year.

AMOUNT OF CLEARANCE BETWEEN PISTONS AND CYLINDERS

No hard and set rule can be given as to the amount of clearance which should be allowed between the pistons and cylinder walls. There are many conditions to be taken into consideration, including the construction and speed of the motor the style, and material of the pistons, also the individuals who are to drive and the service given the motor after grinding.

Even the manufacturers themselves are divided on this point, each having his own pet theory on what it should be. Some idea of how they vary can be judged from the table of a few of the makers of cars shown on the next page.

As a general rule, it is safe to allow

.001 to each inch diameter of the hole on cast-iron pistons.

The majority of the regrinding concerns and, as can be seen from the table, the manufacturers themselves, shade this a little. This can be done, provided the fitting of the piston rings and pins is an A-1 job and that, when assembling the engine, every precaution is taken in regard to squaring up the pistons and rods, to giving the engine plenty of oil. In addition, the driver should operate the car at moderate speed the first few hundred miles.

If, however, it is a taxicab, race car, or motor truck, it is well to be generous on this allowance and make it from .00125 to .0015 in. The heavy duty of the last two classes causes greater heat expansion than in the ordinary motor. With a taxicab, there is no assurance as to the sort of driving it will receive, and therefore it is well to take no chances.

Piston manufacturers in many cases, especially on patented construction or alloy material, can best tell what clearance should be left for their particular style of piston.

When the statement is made that a reground engine which has been fitted with new pistons and rings is better than it was originally, few people can understand why. It is a well-known fact among those connected with the metal industry that castings change shape after they are cast. This is due to strains and stresses caused by the heavier walls of metal cooling last and shrinking from the already cooled lighter walls.

These strains can be relieved if the castings are seasoned for a long time, or by heat-treating processes.

Castings that are immediately machined and put to work in a car, change more or less, due to the heating and cooling of the motor that acts as a heat-treating operation. Therefore, an engine which has been run several hundred miles is thoroughly seasoned and is in ideal condition to be reground and fitted up.

Once having been relieved of all the strains and stresses, the castings will retain the shape continuously after grinding, if properly machined and fitted up.

Actually, of course, an engine does not have any more power after regrinding than that for which it was originally designed.

The fact, however, that the casting is seasoned and that each hole has had individual attention, often gives better results than a general-assembly proposition.

NEW PISTONS AND RINGS NECESSARY

If the cylinder is reground new pistons and rings must be installed. The amount of stock to be removed in order to bring a bore back to a true round hole is usually at least .010 and, if scored or badly worn, will go from .030 to even .040. Such clearance would never allow the use of the old pistons.

Many a perfect regrinding job has been spoiled when the engine is being assembled. If you are in a position to take down and reassemble, then you are more fortunate than many who must trust this final and very important part of the job to someone else.

Great care should be taken first to wash the cylinders and pistons, rings, etc., carefully with gasoline. Be sure every particle of abrasive material and foreign matter is removed.

Make certain the wrist pin fits both the rod and piston, and see that it is securely fastened on. Better go over this an extra time and make sure, for a loose pin or screw will ruin the entire job the first time the engine is run.

Measure the pistons for roundness after assembling with the connecting rods, to see they have not gone out of shape. A slight tap with a wooden hammer will correct any change.

After reassembling the pistons on the crankshaft, test them to see if they are absolutely square. Do not take it for granted, because the connecting rods were straight before it was pulled down, that they will be when you assemble them. There are many chances and reasons why they may have become twisted or out of square. This could happen in taking off the block with the pistons still connected to the crankshaft, when it is an easy matter to bend or twist the rods. Again, in scraping in the connecting-rod bearing or in tightening the caps, a slight variation at this end will increase many times at the piston end.

That the pistons are square is highly important; and, if not, the cylinders might just as well not have been ground, for the pistons hitting on the sides will give all the troubles of an out of round hole.

Put plenty of oil on all the pistons before assembling in the cylinder.

The rest of the assembling is purely a repairshop job, but every detail should be thoroughly gone into as though it were a brand new car. In fact, the vital parts are new and with limits usually closer than those allowed by the manufacturer; therefore, they should demand careful attention.

Be sure the crankcase is well filled with a good light or medium oil and that the system is working perfectly. Run the engine slowly for one-half day, giving it time to cool naturally.

Lapping the holes of worn cylinders will not make them round or straight, because the lapping process is only good for polishing surfaces, and even after hours of work but little material is cut away, leaving much of the lapping compound embedded in the walls. It is an expensive operation, and the degree of accuracy and success depends entirely on the skill and experience of the workman.

A worn cylinder is always larger at the top than at the crank end, owing to the friction of the rings and also to greater heat and poorer lubrication. Therefore, the grinding machine must be used to cut away the material necessary to get a round and straight hole the entire length.

When lapping is done, two metallic surfaces are rubbed together with oil and abrasive material between them.

This will charge the surfaces with grit.

Grinding-in a machine with a hard vitrified grinding wheel running at a high speed to cut the metal away is an entirely different proposition and is the only way to secure right results.

Manufacturers' Clearance of Cylinders

Maker	Finish	Diam.	Clearance	Piston Material
Chalmers	Grind	3¼″	0.005	Lynite
Chevrolet	Ream	3.686″	0.003	C.I.
Continental	Grind	3¼″	0.001	C.I.
Continental	Grind	3½″	0.002	C.I.
Continental	Grind	3¾″	0.002	C.I.
Continental	Grind	4⅛″	0.002	C.I.
Continental	Grind	4½″		C.I.
Dodge	Ream	3⅞″	0.003	C.I.
Franklin	Grind	3¼″	Taper from 0.003-0.001	Magnalite
Hudson	Grind	3½″	0.0035	C.I.
Hupmobile	Grind	3.248	0.001	C.I.
Kelly-Sp'field	Grind	3.7460	0.003	C.I.
		4.4970	0.003	C.I.
Locomobile	Grind	4½″	0.015 0.003	C.I.
Lycoming	Grind	3½″	0.004 0.0065	C.I.
Maxwell	Grind	3.622plus	0.013	C.I.
Mitchell	Grind	3¼″	0.0025	C.I.
Oakland	Ream	2 13/16″	0.005	Alum.
Oldsmobile	Ream	2⅞″	0.004	Lynite
Packard	Grind	2.998	0.002	C.I.
Pierce	Grind	4½″	0.002 0.003	C.I.

Marmon Adds New Enclosed Models

Bodies Are Mounted Directly on Frames, With Floor Partly Sunk Below Frame Line, Thus Giving An Overall Height of Only 76 In.

NORDYKE & MARMON CO. is now building its own enclosed bodies. It has always built the open types, but not until new facilities were available was it found possible to go into the enclosed body field.

After three years of steady development comes the announcement of three new enclosed bodies, the sedan, the suburban and the coupe. Lowness and roominess, a large amount of window space, and provision for road-visibility from the driver's seat are outstanding features of the new models. The design of a slanting windshield has done away with the usual heavy supporting pillars. The permanent side windows mean that the driver has an almost unbroken stretch of glass to the front and sides. As added matters of convenience to the driver, there is the sunshade and the automatic windshield cleaner, vacuum-controlled, set in motion by the driver while the engine is operating.

The appearance of lowness is amply borne out by the actual dimensions. The total height of the car is only 76 in., although the 51½-in. space from the floor to the top in the sedan and suburban and the 50-in. space in the coupe insure comfort. The design of the Marmon chassis permits the placing of the body directly on the frame, with the floor sunk a trifle below the upper frame line, thus making it possible to build such low bodies. This is a factor in bringing about balance and ease of entering and alighting.

An interesting feature of the construction is the care taken to guard against the possibility of squeaks and rattles developing from hard usage. All of the joints have been welded inside and out, thus discarding the old method of welding on one side only. Three experimental bodies were built in this manner, one of each body type, and for over a year they have been receiving the hardest sort of daily usage. This new method of welding will give a tight, long-wearing, non-rattling body.

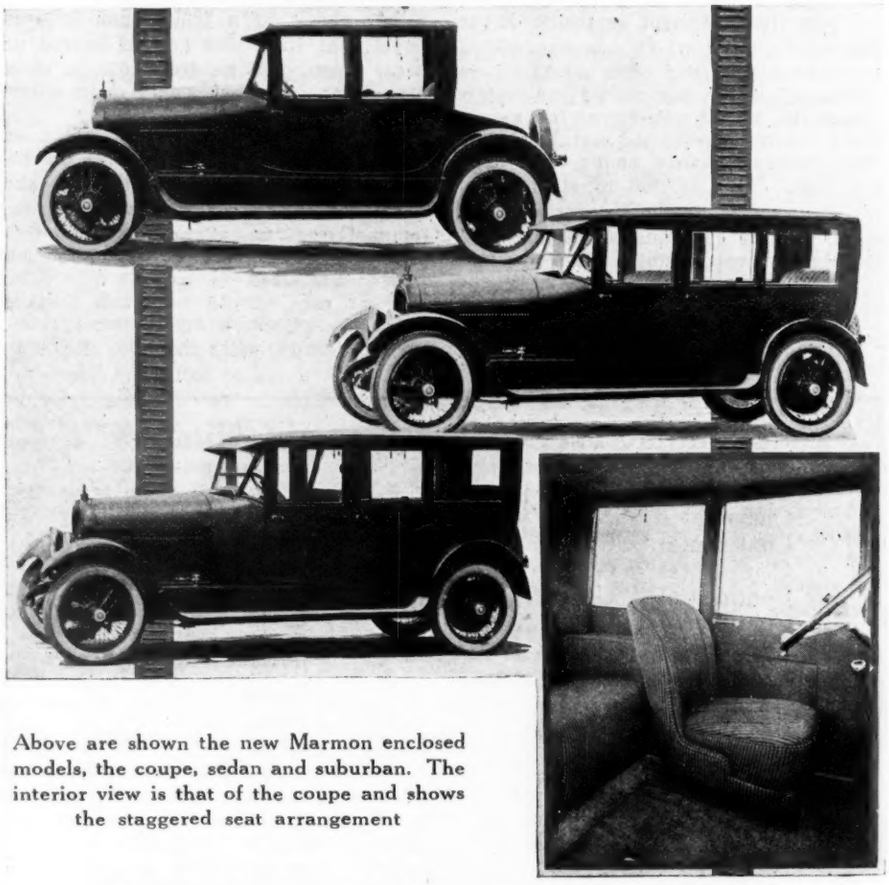
The conventional seating arrangement has been followed in all three cars. The sedan carries five in the rear compartment and two in the front. The suburban differs from the sedan only in the glass partition between the two compartments which may be raised or lowered, as desired. The coupe has a seat for two behind and to the right of the driver, while a seat for a fourth person may be easily folded out of the way.

The upholstery material is of a fine, long-wearing cloth. On the seats a striped pattern is used, and on the sides and for the headlining a plain cloth. The carpet matches the upholstery. Curtains in the sedan and in the suburban are placed in the rear window, rear quarter windows and rear doors.

The interior fixtures, such as window regulators, door handles and lighting fixtures, are of a distinctive design. Among the minor conveniences are the two-dome lights in the sedan and the suburban, the use of hassocks in place of the usual foot rail, and the silk robe rail.

The impression of roominess is backed up by the unusually large windows with square corners, the large doors, and the arrangement of the seats.

These cars are mounted on the regular chassis of the Marmon 34. Their prices, without war tax, f. o. b. factory, are as follows: coupe, $4,875; sedan, $5,275; suburban, $5,425.



Above are shown the new Marmon enclosed models, the coupe, sedan and suburban. The interior view is that of the coupe and shows the staggered seat arrangement

Bosch Battery Ignition System for Fords

CLOSELY following the announcement that the makers of the Bosch magneto were prepared to supply battery ignition systems for automotive engines comes the news that the same firm is now manufacturing a battery ignition outfit for Fords.

This outfit is a simple but ingenious system that has been literally "tailored" to the Ford engine. In designing it, the engineers put Ford engines on the test bench and, with the aid of dynamometers, plotted the curve of spark advance which should be followed to develop greatest efficiency at all engine speeds from starting to maximum. The Bosch compensating governor was then designed so it would regulate the spark advance, making it follow the curve without assistance from the driver.

The only time that the driver has to

touch the spark lever is to retard it when starting, advancing it to the best running position as soon as the engine is operating.

The Bosch coil is wound and insulated much the same as any Bosch magneto armature winding. Although the standard spark test gap is 5 mm. in width, the Bosch battery system will throw a spark over 12 mm., even at the highest Ford engine speed, it is stated.

This outfit has not been designed to run on the current furnished by the Ford magneto. However, if at any time the battery fails, the engine may be started by connecting the red wire from the Ford terminal block to the first left hand terminal of the Ford terminal block, turning the dash switch to the "Mag" position and fully retarding the hand lever at the steering wheel. If the engine does not start with a few turns of the crank, advance the hand lever about a half inch and try again. Somewhere between full retard and half advance the Ford magneto will give enough current to start the engine. If after starting, the engine runs in "jumps," advance or retard the hand lever until it runs smoothly.

NEW ONE-TON LARRABEE-DEYO TRUCK

A 1-TON, 6-speed model is the latest addition to the line of trucks made by the Larrabee-Deyo Motor Truck Co. of Binghamton, N. Y. With this new model the line now consists of 1½, 2½, 3½ and 5-ton sizes.

This new model is at present being tested out on the road. It has a speed of 55 m.p.h. with 2,450 lbs. of dead weight. In a test recently made the truck was driven from 2 m.p.h. to 30 m.p.h. within 50 ft.

Specifications include the following units: Continental 7-R engine; Brown-Lipe clutch and gearset; Gemmer steering gear; Fedders radiator; and Spicer universal joint in the rear and Thermoid in the front. Other equipment includes disk wheels; steel cowl, seat riser and back, with fore doors, all integral.

The wheelbase is 138 in., allowing for 9 ft. of loading space back of the driver's seat. This job, complete with electric lights, starter, cab, windshield and express body, will list for approximately $2,000. Tire equipment includes 34 by 5-in. cords.

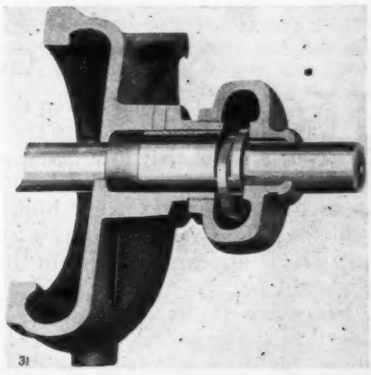
ARROW PUMP SAID TO BE LONG-LIVED

PUMP troubles are said to have been practically eliminated through the design of the new pump brought out by the Arrow Pump Co., Detroit. The sectional view shows the detail of construction of the packing gland and ring oiling system of lubrication. This feature is applicable to any device requiring the packing of a rotating shaft.

In most other constructions grease or oil cups are depended upon to lubricate the bearings, and since the average user of motor cars could not be depended upon to give these the frequent attention they require, the packing was placed at the outside end of the bearing so as to permit the water to enter the bearing, upon the theory that the water would at least keep the shaft and bearing from overheating.

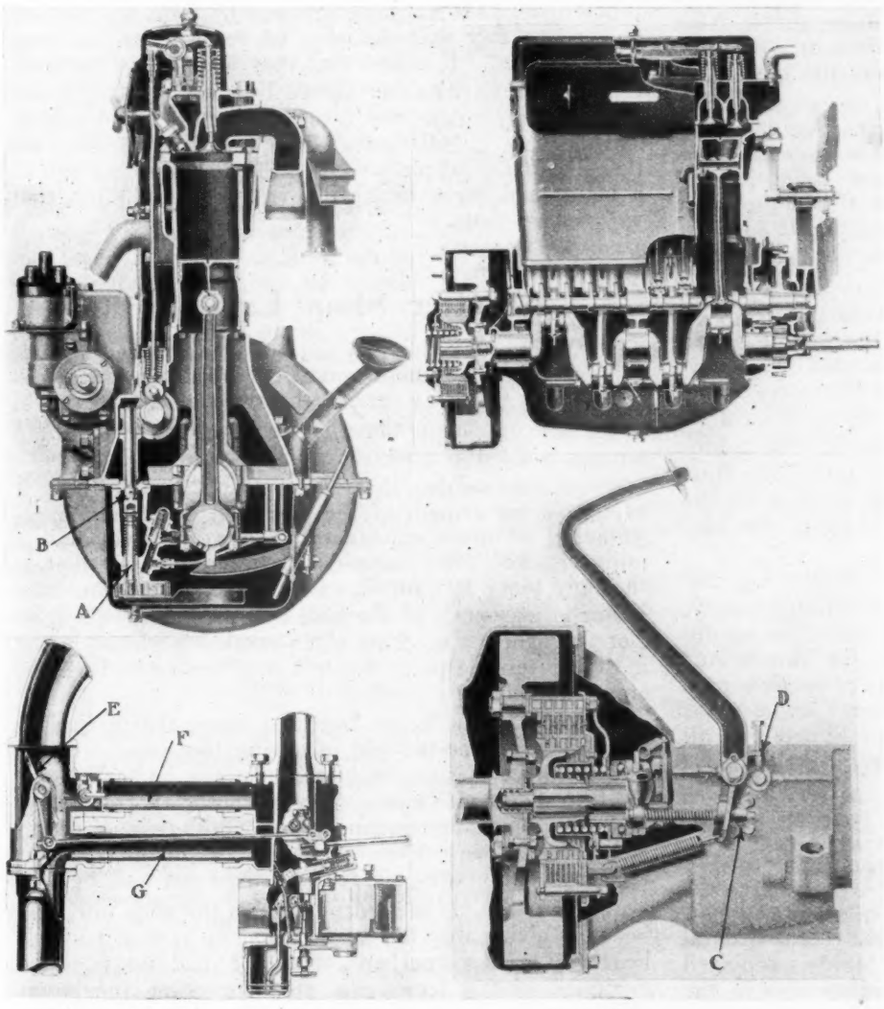
While it is true that the bearings were in this way prevented from overheating, it is also true that the hot water was very injurious to the shaft, causing corrosion and permitting foreign substances such as scale from the water jacket, sand, etc., to be carried into the bearing. This destroyed both the shaft and bearing and resulted in the necessity of frequent replacement of the bearing shaft and packing.

The new construction prevents entrance of any hot water or other substance into the bearings, thereby protecting bearings and shaft from such destructive effect. It prevents the lubricant from being washed out and confines it to the bearings, shaft and packing, making it serve its purpose.



Sectional view of Arrow Pump showing detail of construction of packing gland and ring oiling system of lubrication

Some Sectional Views of the Buick Four Units to Help the Service Man



Sectional views are of help to the service man in determining how to take down a unit and reassemble it. Herewith are shown four views of the new Buick Four. In the end section view of the engine A shows the oil pump, which is so built that it can be dropped out vertically for cleaning or inspection and is entirely exposed when the bottom pan is removed. The slip joint at B makes it possible to uncouple the oil pump drive readily when the pan is dropped. The longitudinal section of the engine gives a good idea of the crankshaft and camshaft bearing layout. The clutch view shows the ease with which adjustments can be made at C and D. The heating arrangement for the carbureter shows at E, the valve which regulates the amount of exhaust heat going through the pipe F and returning to the exhaust pipe through pipe G. As shown, the valve is set for summer temperature. For cold weather driving it is entirely closed.

EDITORIAL

No Time to Make Money

RECENTLY MOTOR AGE received a circular from a maintenance establishment that was making money on an excellent idea—a suggestion which has frequently appeared in this publication. A member of the staff was sent to this shop to hear the details of the venture, which were kindly supplied to him.

After getting the points needed, the MOTOR AGE representative asked if this suggestion had been taken from the publication. The manager replied that he had not seen it there, but it had been suggested to him by a district salesman, who said he got it from MOTOR AGE. The manager added that he "did not have time to read the papers. He was too busy running things."

This raises a very interesting point. As a matter of fact, this man is too busy to advance his own business, so he lets salesmen and others come in and advance it for him. He has taken the suggestion made by the salesman and is spending about $300 on the first effort to advertise it. When he told of this trial for new business, he said that he know it would succeed, because of the early indications.

He is anxious to get ahead with his business and he has excellent plans for pushing an idea, once it is suggested to him, but he has not the time to get the ideas himself. As a matter of fact, he could just as well have used this idea for promotion at the beginning of the summer season, if he had taken the time to read for himself, without waiting until near the end of the season for this salesman to bring the idea around to him.

The difference between the profits on the fag end of the season and what he would have made during the full season he can charge to the fact that he did not take a half-hour and read the idea in MOTOR AGE himself. In the competitive conditions of today a man cannot live for himself alone. He must know what is going on and reach out and avail himself of all possible helps in business, and many of these are found in the trade papers.

Need for Garages

IN a recent statement given out by Secretary of Labor Davis he calls attention to the fact that recent Federal reports show that in a given period builders provided home accommodations for 81,103 families and in the same period garages were built for 93,121 automotive vehicles. The wonder of this statement is that Secretary Davis appears to indicate that the ratio is not what it should be.

Secretary Davis, we believe, is inclined to view the situation wrongly. It is a fact that recently most of the house building has been in districts made possible by the automobile and its kindred vehicles. Recent building reports have all put emphasis on the number of suburban homes. Most suburbs would today be impossible without the motor car and seldom is a suburban home built without the proper housing for the car.

Even in the more congested districts the motor car and its kindred have become prime necessities. It is not through any whim or a desire to spend money that people are today buying motor cars. They are buying them because they need them in their daily life, to provide for them a better means of making a livelihood, to equip them to cover the ground necessary in the making of a living.

Automotive transportation is still new, but it has proven itself. It has been growing by leaps and bounds and it is a fact that the mass of automobiles has been poorly housed. It is time that they were better housed.

The figures are as they should be, and Secretary Davis should congratulate the country on this development, both because it indicates a better business efficiency on the part of the people who own the machines, as well as a better and more healthful life for the families that will ride in them.

Better Shop Layouts

SOME recent visits to automotive repairshops and especially to those conducted by dealers who sell cars as well as service them, have only served to strengthen our contention that shops as a general thing are not laid out as scientifically as they might be.

Oftentimes the line shafting is put up with no thought of the future growth of the shop and the resultant installation of more machinery. Thus, one will find a lathe chucked away in a dark corner, because that is the only place left for it. Of course, where the lathe is not in use much of the time this location is all right. But frequently a machine often needed is placed in the most inaccessible place, while a machine seldom needed enjoys the choicest location.

In some of the better operated shops the machinery is placed with the thought of saving footsteps. Just as our architects design the kitchens in our homes to save the busy housewife many steps, so should those who lay out shops place the equipment to save the time and footsteps of the men. The thought to bear in mind is that men in the shop are paid for working—not walking.

It seems the old idea of putting in the shop one long bench is giving way to that of installing several portable benches, leaving, perhaps, but one stationary bench equipped with a large vise, etc., for doing the larger and more involved operations. The portable benches make it possible for the mechanics to remain with the car, instead of having to make frequent trips to the wall bench.

Shop lighting is another item on which many can afford to spend some time in improving. In new buildings this can easily be provided for, but it is in the older institutions where most of the faults lie. Simply painting the walls white often will work wonders.

Manufacturing Booms on Sales Basis

August Sales Hold Close to High Mark Set in July

Many Manufacturers Will Continue Schedules of Summer Through September; Increases Expected

DETROIT, Sept. 12—Under the leadership of Ford, Dodge, Buick and Studebaker business in September is expected to run considerably ahead of August in the passenger car field and probably will show a slight betterment in the truck field, owing to development of light delivery truck buying.

August production held very close to the marks set in July. Manufacturing in all plants was practically on a sales basis. Some reported a falling-off from July totals but others reported improvements.

Ford led all others in improvement over July, the August total of 117,696 being the highest production mark yet reached. This is capacity production, practically for all plants and assembly stations and under the impetus of the new prices it is believed this figure will be equalled or exceeded in September.

Dodge is continuing at the rate of 550 cars daily and orders are said to be far enough in advance to continue this pace to the first of the year.

Studebaker continues at maximum monthly production of 8,900 cars and reports no indication of a let-up in orders.

Buick led all General Motors units with an August production of 11,750 as outlined. The same pace will be held in September.

Oldsmobile has stepped up its production schedule for September to 80 daily, being influenced in this by the rush of orders following announcement of new prices.

Cadillac will hold its schedule of approximately 75 daily for September.

Oakland ran 25 per cent ahead of July in its August production and looks for a similar gain in September. The company reports its new sport model getting a large share of business.

Scripps-Booth will continue its schedule of 25 daily for the present.

Reo Motor Car Co. reports 100 per cent production in August, the month being its third biggest since it began business. The same production totals or better are looked for in September, the business being divided evenly between passenger cars and speed-wagons.

Briscoe Motor Car Co. reports August business of 30 daily with the same schedule outlined for September.

Handley-Knight looks for a 50 per cent better business in September than in July or August.

Barley Motor Car Co. will increase its output in September.

Saxon looks for increased sales in September owing to increase in its dealer organization and reports from its investigators in the field.

Columbia Motors business increased in August and further increases are looked for in September. Announcement of its new models and prices brought a rush of orders which is continuing.

Hupmobile will step up from an August production of about 1500 to a September output of 2000.

Paige, operating in August on a 65 per cent basis, looks for a decided improvement in September.

Hudson-Essex beat its July figures slightly in August and looks for a real increase in September.

Lincoln, with a production of 225 in August, plans to build 275 in September.

Jackson Motors, operating in August at less than half of capacity, will step up in September.

Dort Motor Car Co. has started a series of 11 openings in its distributor territories which will run into October. These are expected to carry business to new high marks in the fall months. August business was on a par with July.

Packard Motor Car Co. will reopen September 10 after a two-months' vacation period. Orders are reported running high on its twin six and single six cars and production will be speeded up when the factory reopens, to meet demands. Truck business is light, but showing more life than for several months.

National Shows' Allotment of Space Set for Oct. 6

New York, Sept. 12—Application blanks and diagrams of floor space for the twenty-second national automobile shows in New York and Chicago were sent out Sept. 6. As usual, the national shows will be held under the auspices of the National Automobile Chamber of Commerce, Inc., and under the personal supervision of S. A. Miles. The New York show will take place in Grand Central Palace, Jan. 7-14, 1922, and the Chicago exposition, Jan. 28-Feb. 4, in the Coliseum and armory.

All applications for space to be considered in the first space allotment must be sent in not later than noon Oct. 1.

Drawings for space in the automobile sections will take place at the offices of the National Automobile Chamber of Commerce, Inc., Oct. 6. The drawing by applicants who are not members of the National Automobile Chamber of Commerce, Inc., will take place as soon thereafter as possible.

Willard Produces An All-Rubber Storage Battery

New Accessory Claimed to Be One of Most Important Develments in Years

CLEVELAND, Sept. 12—The Willard Storage Battery Co. has produced an all-rubber storage battery. T. A. Willard, inventor and founder of the company, designed the new battery.

Everything in this new battery, except the plates, or grids, is of rubber. The wooden outer box has been supplanted by a case of hard rubber with seamless partitions, eliminating the need of individual jars.

The molded rubber case, besides eliminating the separate battery jar, resists decay and, it is claimed, much more effectively than the old wooden container since it is unaffected by the acid solution or by water. Being a non-conductor it also has less electrical leakage than a wooden case, particularly in damp weather.

The hard rubber case has a tensile strength of 3600 lbs. to the sq. in. and successfully withstands the electrical test of 18,000 volts.

DRAGON MOTORS UNDER FIRE

Chicago, Sept. 10—Charged with misuse of the mails and violations of the blue sky laws, the Dragon Motors Corp. of this city has been thrown into bankruptcy proceedings. Federal and state investigation of the affairs of the corporation, which was known as a million dollar concern and maker of "America's most elegant motor car," has been started.

The promoters are charged with having sold thousands of dollars worth of stock and at the same time with having turned out only 13 Dragons in their studio-factory.

In connection with the Dragon corporation investigation, the affairs of the Neidich Finance Corp. and the Lincoln Service Corp. are being looked into. Herman W. Neidich, president of the Dragon Motors Corp., is also president of the other two companies, which, it is alleged, were organized solely to sell Dragon stock.

DEALERS IN DRIVE-AWAY

Indianapolis, Sept. 12—Thirty-five Haynes dealers from western Pennsylvania, headed by George M. Evans, president of Coulter Motors, Inc., Haynes distributor at Pittsburgh, arrived at the Haynes Automobile Co. recently to drive away 50 Haynes models.

Insurance Company Heeds N. A. C. C.'s Moral Hazard Plea

Readjustment of Policies Is to Follow New Plan of Writing Risks

NEW YORK, Sept. 12—The contention of the National Automobile Chamber of Commerce that the heavy losses of insurance companies on automobiles with the consequent necessity for imposing high rates has been due largely to lack of consideration for the "moral hazard," has been accepted by the National Liberty Insurance Co., which has ordered a clean-up of its automobile business.

A statement by the company says that "many policies have been issued without reference to the character and standing of the insured and without adequate knowledge of the risks assumed" and that "many policies as now written are invitations to the unscrupulous to perpetuate frauds upon the insurance companies."

These statements are contained in a letter sent to agents announcing that commissions payable hereafter will be uniformly 15 per cent, with a contingent of 15 per cent subject to certain conditions.

"Many automobile policies issued by this company, now enforced, are for amounts in excess of present market values," says the letter. "Should total loss occur, the insured should not expect to receive more than replacement value of the car, which in many cases will be several hundred dollars less than the insurance carried. A readjustment will be made of such policies reducing the amounts of insurance to approximately the present market value."

I. A. T. A. MEETS IN NOVEMBER

Indianapolis, Sept. 14—The first annual convention of the Indiana Automotive Trade Assn. will be held Nov. 16 and 17 in Indianapolis. Members of the board of directors have expressed the belief that the work of the association in its first year has been of such value to the automotive industry of Indiana that this first annual convention can be expected to draw not less than 2000 automotive merchants. Some of the most outstanding figures in the industry will be sought for the program. Harry G. Moock, general manager of the National Automobile Dealers Assn., has assured the Indiana directors that the national organization will give every possible aid to developing for the Indiana convention of a program of unsurpassed merit.

200 Cars Valued at $300,000 Week's Swag in Quaker City

Philadelphia, Sept. 12—Following a report of the largest number of automobiles ever stolen in this city within one week, namely 200 machines, valued approximately at $300,000, the city police department asserts its belief that the increase in thefts is due to the recent price cuts in expensive cars and to the owners of some of these high priced cars working in conjunction with the "car thief trust," members of which steal automobiles with the consent of the owners.

The police explain that the graft is worked in this way: a man who six months ago paid $4,500 for a car and insured it for the same amount, finds the manufacturer has reduced the price by $1,000. The owner decides that one way to get full value out of his car is to have his car "stolen" so he can collect the insurance money. When the owner of the "stolen" machine collects, he is able to buy a new car for three-fourths the amount he paid for the first one, and, in addition, he sometimes shares in the spoils, which the thieves receive from selling the parts of the stolen machine.

M. A. M. A. Sends Message of Good Cheer to Industry

New York, Sept. 12—This message of good cheer is being sent broadcast by the Motor and Accessory Manufacturers' Assn. through its 400 affiliated companies, on stationery, advertising and catalogues:

HAVE FAITH IN YOUR INDUSTRY!
The facts justify it—
Courage compels it—
Progress assures it—
Destiny proclaims it—
Business requires it—
The world needs it—

Civilization will not go into reverse—
THE AUTOMOBILE INDUSTRY MUST GO FORWARD!

This slogan expresses the spirit and plan of the credit convention which the association will hold at the Hotel Statler, Detroit, this week.

In addition to the topics relating to finance and credit, there will be a symposium by sales and advertising executives on the subject, "Selling Strategy to Bring the Automotive Industry Back to Normal."

In line with the association's message of unswerving confidence, several speakers will discuss the topic, "Why I Have Faith in the Automotive Industry."

CANADA ADDS CUSTOMS' FEE

Ottawa, Ont., Sept. 10—The government has been empowered to institute a system of certificates to be attached to all invoices of foreign goods imported into Canada at the last session of Parliament. It is proposed to charge a fee of $2.50 for certificates on invoices of $100 or over, these certificates to be signed by a Canadian trade commissioner, British consul or other person duly authorized.

Canada spent $240,000 in paying expenses of the various trade commission officers and received nothing in return during the year. The United States consulate during the same time spent about $270,000 and received in fees something like $500,000 from Canada's exports of about $500,000,000.

Goux in Ballot Car Breaks World Road Record in Italy

Covers 324-Mile Course in 3:35:9; Chassagne Second; De Palma Abandons Race

(Special Cable to Motor Age)

PARIS, Sept. 12—Jules Goux, in a Ballot, broke the world's road record and established new records for cars of 183 cu. in. piston displacement in winning the Italian Grand Prix at Brescia, Sunday, Sept. 4. His time for a distance of 324 miles was 3 hr. 35 min. and 9 sec. Chassagne, in another Ballot, was second in 3 hr. 40 min. and 52 sec., and Wagner, in Fiat, was third in 3 hr. 45 min. and 32 sec.

Bordino, in a Fiat, broke the lap record with an average speed of 94 miles an hour, but was forced out by a broken oil lead after being well in front from the beginning of the race. Sivocci, in a Fiat, was forced out by a leaky tank and De Palma abandoned the race near the end.

OHIO MEMBERS HEAR SHERMAN

Columbus, O., Sept. 10—A gathering of 42 members of the National Automotive Equipment Assn., together with their salesmen, attended a "ginger" meeting called at the Athletic Club Sept. 3, to hear Ray Sherman, who is connected with that organization as merchandising director, expound his new ideas of salesmanship. The meeting was called when it was arranged to have Sherman in Columbus, and many responded, as they were much interested.

The firms represented at the meeting were the Justus & Parker Co., the Griswold-Sohl Co., the Pennsylvania Rubber & Supply Co., the Columbus Varnish Co., the J. I. Cooper Rubber Co., and the J. P. Gordon Co .

PROVE AUCTION SALE METHOD

Charleston, W. Va., Sept. 10—An unusual method of disposing of automobiles has been adopted by the Overland-Perry-Curtis Co. of Huntington. Two auction sales were held a few days ago on a vacant lot and at each the cars offered by the auctioneer brought almost market prices.

Perry served as auctioneer. He announced, following the sale, that the company will likely adopt this method of disposing of the used cars which find their way to the company's salesroom.

TERRE HAUTE IS WINNER

Indianapolis, Sept. 7—Officials of the Marmon Co. here have finished checking up on national demonstration week, which took place August 15 to 20 throughout the country. It has been announced that the Central Auto Co., distributors of Marmon cars at Terre Haute, won the first prize for making the greatest number of demonstrations during the week. The competition was based on 1920 population figures, in order to give all sales companies an equal show.

German Bosch Magneto to Compete With American Co.

New Concern With Otto Heins at Head Is Capitalized for $250,000 in New York

NEW YORK, Sept. 12—The Robert Bosch Magneto Co., Inc., which has been incorporated at Albany with a capital of $250,000, has opened offices in New York City. Otto Heins, who was president of the Bosch Magneto Co. before it was taken over by the alien property custodian and reorganized into the American Bosch Magneto Corp., is president of the new corporation. He has a suit pending against A. Mitchell Palmer, former alien property custodian, and officers of the American Bosch Magneto Corp. for the return of the property and patents on the ground that fraud was practiced in their sale. Pending the outcome of the litigation for the return of the original Bosch property and patents, Heins says the new company is going ahead with the manufacture of magnetos on the old patents.

May Sue for Infringement

Harvey T. Andrews, attorney for Heins in his action against Palmer, is secretary and general counsel of the new company. He does not deny that the American holders of the patents may sue for infringement of their rights when the new company begins production of Bosch magnetos, but in this connection he contends that the purchasers of the patents at the sale by the alien property custodian paid only $1 for the patents.

"Under these circumstances," Andrews said, "it would be interesting to find out what part of that amount, if any, would finally be allowed by the court as damages, assuming that the present holders of the patent sue for infringement and that they are successful in such a suit."

The treasurer of the new company is Guenther Jahn, who was a stockholder and an officer of the original Bosch Magneto Co.

Heins is a German citizen and an engineer of long experience. He organized the Bosch Magneto Co. in this country with a small capital and asserts that he controlled the company at the time it was seized by the alien property custodian, although Palmer contended that the stock actually was owned by Germans living in Germany, chiefly by Robert Bosch.

Will Manufacture Electrical Devices

Heins has not selected a factory site, but says he is considering several plants already built. According to his statement, the new company will manufacture magnetos, spark plugs, starting and lighting systems for automobiles, airplanes and motor boats, as well as other electrical devices.

It is the purpose of the Robert Bosch Co. to compete with the American Bosch Magneto Corp., and it will offer for sale magnetos manufactured here and also in Germany. The Germans claim to be able to manufacture such articles more cheaply than they can be made in America. The company also claims to have a new Bosch invention for use in low priced automobiles. This is a combination battery and ignition system. It also will offer a new Bosch electric lighting system for high priced cars. Heins has filed applications for new patents in the patent office at Washington.

Hares Motors Future Is Unaffected by Locomobile

New York, Sept. 12—Dissolution of the contract with the Locomobile Co. held by Hares Motors will have no effect on the future of the latter corporation. Hares Motors will continue to handle the sales of the Kelly-Springfield Motor Truck Co., and it is understood negotiations are pending for the taking over of the sales of one or more established passenger car lines.

If Hares Motors does not enter into contracts similar to those it held with the Mercer and Locomobile companies, it intends to revert to its original plan of developing a complete line of passenger cars and trucks. The engineering department of the company has worked out detailed plans for a complete line of both classes of vehicles. This would include passenger cars in three price classes and trucks of various capacities. The Hares Motors organization remains intact and no changes are contemplated.

No successor has been appointed as yet to A. K. Stewart, who has resigned as general manager of the Kelly-Springfield Truck Co. and returned to New York. Stewart took charge of the factory Feb. 1. The Kelly-Springfield plant is being operated on about the same basis as for the past few months, but the outlook for business is understood to be gradually improving.

FORDS DROP IN CANADA

Detroit, Sept. 10—The Ford Motor Co. of Canada, Ltd., has announced new prices on all models. The touring car hereafter will sell for $565, the roadster $515, the chassis for $470, the coupe for $890 and the sedan for $990. The truck chassis will sell for $615. Starting and lighting equipment will cost $85 additional.

TWO NEW REO BODY MODELS

Lansing, Sept. 12—Reo is now turning out two new body models, the Model T Six Series B touring to sell for $1675, and the Model U Six Series B business coupe. These are built on the Model T chassis of last year which is continued with only minor refinements. On the open model there are two auxiliary seats; the rear seat cushion is a separate assembly and can be removed to allow access to the carrying compartment for the curtains which is large enough to take them without folding. The coupe is designed for professional use and is very completely equipped. The price is $2150.

Receivers Are Appointed for American Motors Corp.

Company, Maker of American Balanced Six, Lists $3,500,000 Assets and $600,000 Liabilities

NEWARK, N. J., Sept. 12—Federal Judge Lynch has appointed receivers for the American Motors Corp. of Plainfield in an equity suit filed by attorneys representing 80 per cent of the creditors of the company. The action is understood to have been taken with the consent of the company and is said to be equally for the protection of the creditors and the stockholders. The nominal assets are listed at $3,500,000 and the liabilities at $600,000. The company is a Virginia corporation with a paid up capital of $1,260,000.

The receivers appointed were Proctor W. Hansel, first vice-president and treasurer of the company, Plainfield, and James Kearney of Trenton. They were authorized to carry on the business for 30 days. The Fisk Rubber Co., with unpaid bills aggregating $29,257, is the largest creditor.

The American Motors Corp. was incorporated in 1916 to manufacture the "American Balanced Six." Production was begun in the early part of 1917. The 1919 dividend on the preferred stock was paid April 15, 1920. The general balance sheet as of Jan. 1, 1921, fixes the value of the plant and equipment at $272,907 and the inventory at $433,865. Cash amounts to $152,396 and notes and accounts receivable to $91,493. Good will was valued at $1,558,272. The notes and accounts payable amount to $357,571. There is a mortgage for $55,000.

The directors of the company are Robert Bursner and R. D. Mock of Cleveland, P. W. Hansel, Guy Morgan, E. G. Hines and George G. Gates of New York, C. B. Penny and William Newcorn of Plainfield and R. J. Mebane of Greensboro, N. C.

Affiliated with the corporation is the American-Southern Motors Corp., incorporated in North Carolina in 1919 to assemble the American Balanced Six for distribution exclusively in 12 southern states. The subsidiary company merely assembles the car which is manufactured at Plainfield. The plant is located in Greensboro, N. C.

CHEVROLET MODEL CHANGES

Detroit, Sept. 14—Changes in specifications have been made in the 490 model, Chevrolet roadster which was reduced in price last week. The model has undergone construction changes whereby the rear axle uses a spiral bevel ring gear and pinion and hand controlled emergency brake lever. Timken Roller bearings are substituted in the front wheels. A new assembly method has been introduced, securing positive alignment of transmission.

69 Lines Exhibit and Sell At Indianapolis Fall Show

Dealers Plan to Divorce Association From State Fair and Occupy Building in City

INDIANAPOLIS, Sept. 10—The Indiana farmer is buying trucks. He also is buying tractors, and passenger cars. This is in the face of the very discouraging stories circulating about Indiana crops in general. Exhibitors at the Indiana state fair last week, after the first three days, tried to outboast one another on the amount of automotive equipment reported sold. Boiled down to even 25 per cent of their face figures, these boasts indicated something of a record run of business for the fall motor show, the twenty-third annual event staged by the Indianapolis Automobile Trade Assn.

Quite a few changes were noted from the list of exhibitors in the big show of March this year. For the first time the Wills Sainte Claire was in this show. The cars and chassis for this exhibit were in a train wrecked near Monon, Ind. Nearly every railroad man on the Monon line came into contact with Ray Brown, of R. D. Brown & Co., Wills Sainte Claire distributor, in his efforts to locate and move the cars. They were rescued and placed in the exhibit a half hour before opening time.

Andy Hutchinson, secretary of the I. A. T. A. was not so fortunate. His plans for a premier for the Detroit Junior electric car, were spoiled when the shipment was lost in transit and at mid-week had not been located.

Exhibit Valued at $80,000

The largest and most expensive exhibit was by the Losey- Nash Co., which was valued at more than $80,000. Four exhibitors were in the show for the first time. Eighteen exhibitors of the March show were absent from this show but there are 11 more exhibitors in this show than there were in March. There were 69 motor vehicle lines on display.

Departing from the old "still" exhibits, the tractors and some of the trucks gave power demonstrations and control and flexibility trials. And the answer was found in the difference between the interest of the small "lookers" in the "still" show inside, and the "questioners" in the close packed groups at the motion show under tents and in the open air. It was freely predicted that this would be the last time that the trucks and tractors would seek or be permitted to have space in the "still" show.

The sentiment of the passenger car men is so strong against permitting truck exhibits in the same building, and the truck exhibitors see the comparison in results so clearly, that it is expected there will be complete harmony on a proposal to exhibit industrial and commercial units separately, and in motion.

Because of the general dissatisfaction of the Indianapolis association, at the treatment by the fair board this year, there is a general undercurrent of hostility. This accounts for the rather general comment that the March, 1922, show will be the last exhibit of motor vehicles, by the Indianapolis association in the manufacturers' building at the fair grounds.

This building, costing $125,000 was erected by the state fair board, for motor vehicle shows, at the instance of the I. A. T. A. which guaranteed a yearly return. The I. A. T. A. has faithfully discharged its part of the contract. This year, however, the fair board, changed somewhat because of its transition from a quasi-public board of the past to a 100 per cent political-public board under control of the state agriculture department, has according to John B. Orman, broken about every provision of its contract. As a result, it is believed the Indianapolis association will this winter perfect plans for a downtown building, which can be put to general storage uses, and opened for the two motor shows each year.

New Grand Prix Regulations

NEW YORK, Sept. 10—A cable dispatch from France says that as a result of American-made automobiles winning the Grand Prix, the sporting committee of the automobile club of France has decided that in the race next year entries will be open to the world but that unless one-third of the cars entered are French as well as one-third of the manufacturers represented, the club reserves the right to call off the race. The club feels that this puts the question squarely up to the French automobile makers, who must provide the required proportion of French contestants if they want the race run.

LIGHTHOUSES FOR MOTORISTS

Portland, Ore., Sept. 10—Lighthouses to guide automobile traffic at night over the highways of Oregon may become a reality as a result of the action of the state highway commission. It has voted to erect two lighthouses at points on the lower Columbia river highway for experimental purposes, and if they prove successful, more will be put up.

The signals, as selected by the commission, provide brilliant lights that will operate automatically for eight months without attention, it is claimed. The lights will probably be arranged to flash at intervals, like lighthouses at sea, so that the motorist can readily distinguish them at a distance from other lights.

Careful study of the operation of the two signals will be made during a period of eight months, when the question of establishing the signals throughout the entire state will be considered.

Gasoline Prices Decline On Expanding Consumption

Average Drop Is 31 Per Cent on 710,447 Gallon Daily Increase for Six Months

NEW YORK, Sept. 12—The consumption of gasoline in the United States during the first half of the current year was larger by 259,313,353 gallons, or a daily average of 710,447 gallons, than that of the corresponding period of 1920. Total consumption was 2,300,115,990 gallons compared with 2,142,705,363 gallons in the first six months of last year. Production was larger than the previous year by approximately 18 per cent, but in spite of the enormous demand, prices of gasoline have declined in all sections of the country. The decline, however, is attributed solely to the lower cost of crude oil, as it is contended that until recently there has been little or no reduction in the cost of refining, while transportation charges are at the same level as they were at the peak of 1920.

Reductions in gasoline prices on the average amount to 31 per cent, taking the leading cities of the United States as a whole. The average price at the close of August was 20.2 cents, compared with 29.3 cents a gallon on Jan. 1 of this year. The drop, in all, amounts to 9.1 cents. The largest declines since the beginning of the year have been at Dallas, Tex., and Denver, Colo., where they amounted to 13 cents a gallon in each city. The lowest wholesale prise is 15 cents a gallon at Kansas City, Mo., while the highest is 25.5 cents in Boston.

DUNLOP CHANGES NAME

Buffalo, Sept. 12—Although a change of name has just been announced by the Dunlop tire interests, whose $25,000,000 plant here is virtually completed, there has been no change in ownership of the company, it is officially announced.

Announcing change of name from Dunlop American, Ltd., to The Dunlop Tire & Rubber Corp. of America, Perry D. Saylor, president of the corporation, said the firm has not been placed on a new financial basis and has received no new financial backing. The change in name was decided upon nearly a year ago, he said, but announcement is just being made here.

Saylor said it has not been determined when the big new plant will be placed on a commercial production basis.

PLAN 6-CYLINDER RANGER

Houston, Tex., Sept. 10—The Southern Motor Mfg. Assn., Ltd., is now at work on the production of a 6-cylinder model. This will be known as the Ranger, having the same name as the previous 4-cylinder model which has been on the market for some time. The new six will be fitted with a number of different style bodies, including both sport and conservative designs.

IN THE RETAIL FIELD

Reo Motor Car Co. of San Francisco, Calif., formed to handle this car throughout the state as well as in several other states of the Pacific slope, is putting a Reo dealer in every important town of northern California. P. L. Emerson, vice-president of the company, is directing this forging of the chain of dealers, and his latest appointment is that of the Skinner-Hammond-Murray Co. of Stockton, to handle the Stockton territory, a large and rich district in the mouth of the prosperous San Joaquin Valley. The Napa Motor Supply Co. has been given the Napa territory; the Petaluma district has been allotted to George Vogensen and Clarence Snygg, and the Santa Clara territory has become the exclusive property of Hamlin & Son, of San Jose.

Stutz Motor Car Co. of America, Inc., has appointed the California Stutz Co. distributor of the Stutz for northern California. The appointment came as the result of negotiations carried on for some time between Fred Wilson, assistant sales manager of the national organization, and L. D. Allen, general manager of the California Stutz company.

Ray D. Brown, president of the R. D. Brown & Co., Indianapolis, announces that the first showing in Indianapolis of the Wills Sainte Claire car will be during the coming Indianapolis automobile show. This company recently secured the local distribution of the car.

Melvin Co., Indianapolis, has announced that it has secured the local distribution for the Westcott car.

Curtiss-Indiana Co., Kokomo, Ind., has been appointed Haynes dealer for Howard, Cass, Tipton and Miami counties. Wilbur M. Fagley, general manager of the Curtiss-Indiana Co., will be in active charge of the sale of Haynes cars in this territory. The Oldsmobile agency will be discontinued by Fagley.

B. F. Nicholas, who has been managing the Overland and Willys-Knight sales agency at Kokomo, Ind., for the past two months, has made arrangements to take over the salesroom occupied hitherto by the Isenhour company. Mr. Isenhour having turned over the Haynes sales agency to the Curtiss-Indiana Company.

Shelby Motor & Tractor Co., Inc., Shelbyville, Ind., has taken over the Bowen Bros.' Ford & Tractor Agency, and also the contract of the Ford agency with the Ford company. F. Stafford, Indianapolis, vice president of the new company, is now in charge of the business.

Asheville Overland Sales Co. has been taken over by the Asheville Overland Knight Co., successors. C. A. Thomas is vice-president of the new concern and E. S. Clark is general manager.

Asheville Overland Knight, Inc., has bought the interest of the Overland-Asheville Sales Co., Asheville, N. C., and is taking over the distribution of Overland and Willys-Knight motor cars. E. S. Clark is general manager; C. A. Thomas, vice-president and treasurer, and Joe L. Deadwyler, secretary.

Pfeffinger & Armstrong, Gridley, Ill., has dissolved partnership, the former retiring after disposing of his interest to a brother of his partner. Russel and James Armstrong will hereafter handle the business under the name of Armstrong Brothers.

Harry C. Noble, Decatur, Ill., has been appointed distributor in the central and southern Illinois territory for the new Durant car.

O. J. Dohlen and Cliff Hosking, Rockford, Ill., has purchased the auto accessory store of W. P. Bennethum. The name of the store will be known hereafter as the "House of Service."

Southern Motors Co., Louisville, has been bought by L. J. Hannah, vice president of the company and Lee Miles, president of the Louisville Taxicab & Transfer Co. The company, capitalized at $125,000, will change its name to the Hannah-Miles Co. and will continue to handle Dodge Brothers cars exclusively. Hannah will become president of the company and will act as general manager.

Lathrop-McFarland Co., Indianapolis distributor of Cole and McFarland automobiles, has assumed the state distributorship of the Oldsmobile line of passenger cars and commercial wagons.

Charles E. Stutz Sales Co., Indianapolis, distributor of the H. C. S., has been assigned the Indiana contract for distribution of the Lincoln automobile.

The Melvin Co., Indianapolis, has become Indiana distributor for the Westcott motor car line.

Christ & Patrick of Havana, Cuba, has been named agent for Cuba for the Premocars, built by the Preston Motor Corp., of Birmingham.

Cole Aero Eight agency of Birmingham, Ala., has been transferred from the Taylor Motor Co. to the Ewart-Brewer Motor Co. In addition, the Cole Ewart-Brewer will continue as agents for the Haynes and Elgin Six.

Edwards-Hanna Motor Co., Birmingham, Ala., will establish a general Ford sales and repair shop. Partners of the new company are: Aubrey Edwards, who has been employed at the Ford Detroit factory; T. A. Hanna, local business man; Frank Stevens, former banking and automobile business man, and E. K. Bowling, popular automobile dealer, until recently with another leading company.

Atlas Truck Corp., York, Pa., has opened a direct factory branch in Chicago, with E. B. Miller, manager.

Alvin H. Smith and William F. Moore have started a retail sales organization which will be known as the Smith & Moore, Inc. The company will handle Fords, including the various classes of automobiles, trucks and tractors. The new company is the ninth agency of this sort to be started in Marion county, which includes Indianapolis.

Albemarle Motor Co., Albemarle, N. C., has begun the construction of a new garage here. The building will be of brick and modern in design.

Leach Biltwell Motor Car Co., Los Angeles, will open a factory branch in San Francisco, within the next few weeks. The first showing in the Golden Gate City of the 1922 Leach models will occur early in November.

F. H. Johnson has taken over the distribution of the Oakland line in northern California, with headquarters in Sacramento and branch offices in Marysville and Chico. H. W. Whitten, who has had the Oakland car in Sacramento, will continue his parts business, and probably will announce the agency for another car in the near future.

James Compton and J. V. Ninemiers, Colfax, Ill., have opened a modern garage and accessory store.

Springfield, Ill., Automobile Dealers Assn. has launched a membership drive in order to bring into the fold every automotive dealer in the city. It is desired to start the fall with every garage proprietor also enrolled.

OPENS TRACTOR SHOW OFFICES

Chicago, Sept. 12—Offices for the preliminary work in connection with the Seventh National Tractor Show and Educational Exposition to be held at the Minnesota State Fair grounds, Minneapolis, Jan. 30 to Feb. 4 inclusive, have been opened in the offices of the National Implement & Vehicle Assn., Chicago. E. E. Whaley, manager of the show, will make this office his headquarters until later in the year, when his headquarters will be moved to Minneapolis.

In certain distinctive features the plan of the Minneapolis show will follow that of the Columbus, O., show last February. The educational features of the show will be emphasized, and in addition to lectures on various phases of power farming, a tractor short course will be put on under the auspices of the College of Agriculture of the University of Minnesota.

DETROIT BUS LINE GROWS

Detroit, Sept. 10—Accomplishments of the Detroit Motor Bus Co. for the first full year of operations have exceeded expectations. The first line was opened June 11, 1920, with six buses covering a four-mile route. Gross earnings now are averaging $3,500 daily, compared with $500 the first day.

During six months and 20 days of 1920, gross earnings were $250,000 for six months ended June 30, 1920. Gross earnings for 1921 were $324,830 and for July, $108,460.

Truck Lines in New England Stir Up Railway Officials

Motor Vehicles Cut Deep Into Business Formerly Monopolized by Railroads

PUTNAM, Conn., Sept. 10—Operation of scores of motor trucks, engaged in general commercial work on either long or short hauls through this section of New England are eating into railroad freight business to such an extent as to attract the attention of higher rail-transportation officials, who have directed that an inquiry be conducted, with a view of bringing about remedial action.

Railroad freight experts have been in this territory during the past week to interview shippers as to why the railroads cannot regain some of the business they have lost. Some of the shippers have been especially frank with the railroad men and have pointed out to them that the high freight rates and, oftentimes slow service, have resulted in much business being diverted to the truck service. This is especially true in regard to the handling of raw and finished materal for the many manufacturing plants in this section and many of the mercantile houses. Trucks are used not only between this territory and Boston, Providence and New York but in shorter hauls to steamer termini at Norwich, New London and Stonington.

Many of the mills and mercantile houses own and operate their own fleet of trucks, while many firms are engaged in the trucking business by contract. Steamship lines, with a view to getting the patronage of small shippers and others without truck service, have inaugurated a truck service of their own, from their docks into the surrounding territory for a 50 or 100-mile radius.

In other conferences with railroad representatives, shippers of this territory have cited numerous instances of freight delay, that they claim are characteristic of general conditions. Shipments from Worcester, Mass., to within five miles of Putman and only 30 miles from Worcester, in a direct line, have often, shippers say, been upwards of a week in getting through. The same is more or less true, they claim, relative to shipments from Providence and other points into this territory.

They point out that the trucks have proved dependable and have furnished a fast delivery service. The manner in which they have eaten into the so-called "local" business of the railroad lines, especially the New York, New Haven & Hartford Railroad, is little realized, it is stated, excepting by the railroad men. It is freely admitted by freight officials that the New Haven road, and probably the others, will seek means of speeding up its local freight service, in an attempt not only to compete with the trucks but to regain some of the business it has lost.

Fresno 150-Mile Race to Have Long List of Stars

San Joaquin Valley Classic Oct. 1 Will See 14 or 15 Best Known Contenders

FRESNO, Calif., Sept. 10—The San Joaquin Valley classic 150-mile speedway race, the big spectacular event of the Fresno District Fair, Sept. 26 to Oct. 1, promises a record number of entries. By the end of August, one month before the big race, the mails had brought in signed contracts from 11 of America's leading racers. The total number of entries will probably be 14 or 15, allowing for other contracts to come in, and possibly one or two eliminations in the trials.

One of the earliest to sign up to race again at Fresno speedway was Jimmy Murphy, the daring driver who carried Uncle Sam's colors to victory in the Grand Prix in France over the pick of the world's winged wheel artists. Murphy was the winner of the Raisin Day race at Fresno last year.

Another popular entry is Joe Thomas, winner of the Fresno Raisin Classic in April this year. Thomas is one of the coolest and stubbornest stickers behind the wheel, and can be relied upon to be in the main argument. Tommy Milton, with the chief honors of the big international race at Indianapolis among his scalps, has an idea that this year's Valley Classic also ought to be his. But the three foregoing will have a strong and heady contender again in Roscoe Sarles, Tacoma winner on July 4, last, and always a fighter up to the last lap.

Other men who have been among the entries lately include Eddie Hearne, who won on the new Santa Rosa speedway Aug. 4, last, and established the record all-route speed of 111 85/100ths m.p.h. over the 150 miles distance. His closest rival there was Alton Soules, also a favorite in Fresno, who ran Hearne a thrilling neck and neck whirl for 45 laps, and was only forced to quit when his engine burned up. Eddie Miller, with his fine Duesenberg record, retains his place in the team.

Edwards Meyer, Jr., a Newcomer

Joe Thiele, who made such a good showing at Indianapolis and finished fifth in a field of 25, will be here. A newcomer among the entries this year is Edward Meyer, Jr., of Redlands, only a stripling in years, but a speedway bug since he left school. Another lad who will need watching is Frank Elliott, of Hanford, who has grittily forced his way right to the front among the younger school of racers, and may prove to be the "dark horse" of the Fresno grind on Oct. 1. An older hand who is known to possess "lots of stuff" is Tom Alley, Ralph de Palma's old mechanician, veteran of many races, who is pinning his faith at Fresno to a new car.

There is a good chance of Ralph de Palma being back from Italy in time to take part in the San Joaquin Valley contest. The $2,000 fund that is being raised by enthusiasts to provide lap prizes may prove an additional inducement to them to sign up.

The Fresno Speedway Assn. is putting up $15,000 in prize money for the race on Oct. 1, and this will all be staked on the one event, the 150-mile race. In addition there are guarantees to all the national entries, and the leader on points in the national championship on the day of the Fresno race will receive an additional $500. The prize money is allotted as follows:

First	$5,000	Fifth	$1,000
Second	3,000	Sixth	1,000
Third	2,000	Seventh	1,000
Fourth	1,500	Eighth	500

The race will be run under the rules and with the sanction of the contest board of the American Automobile Assn. A total of 675 points in the national championship is at stake on the race, divided as follows:

	Pts.		Pts.
First	300	Fifth	30
Second	160	Sixth	20
Third	90	Seventh	15
Fourth	50	Eighth	10

At present Tommy Milton is leading in the race this year with a total of 1,710 points, and Roscoe Sarles, with 1,505 points, is second. The result at Fresno is bound to have an important bearing on the championship contest.

Durant Buys Canada Plant to Be In March Production

New York, Sept. 12—Preparations are being made for the incorporation of Durant Motors of Canada, Ltd., for which a plant at Leaside, near Toronto, has been purchased by W. C. Durant. The plant site includes 18 acres, and plans already have been made for the erection back of the present building of a three-story assembly plant 600 by 130 ft. The old building will be used for the manufacture of motors, axles and differentials. There also will be erected a woodworking plant for the construction of bodies. It also has been learned that the Durant interests will manufacture in Canada the tires which will be used on the car made there. In fact, every part used will be made in Canada, including the electrical equipment.

While no official information is obtainable at Durant headquarters, the natural inference is that if all the parts which go into the Canadian car, including tires, are to be made by Durant, the same procedure ultimately will be followed in this country. The Canadian plant will be put in operation next March with a capacity of 100 cars a day.

The Durant Four already is in production at the Long Island City plant and a few already have been turned over to purchasers. Production will be increased steadily.

Marked progress is being made in redesigning the Sheridan, which will be known as the Durant Six. The body lines will be similar to those of the Durant Four.

Automobile Insurance in Throes of Radical Changes

Agents of Firemen's Fund Company Are Writing Policies Under New Set of Rules

CHICAGO, Sept. 12—Radical changes in its methods of writing automobile insurance have been announced by the Firemen's Fund Insurance Co. Agents are being advised of a revision in the acceptance limits on automobiles and a change in the general conditions under which such insurance may be written.

Within recent months the fire feature in automobile insurance has come to the front with unusual force and theft risks are no longer considered the only source of loss. Losses from both causes are no longer confined to large cities but are spreading through the rural districts in such numbers as to cause alarm.

Under the new rules cars will be insured for not more than 90 per cent of their list price, irrespective of freight, war tax and the ordinary equipment. Second-hand cars will carry not more than 80 per cent of their purchase price; full particulars must be furnished on all mortgaged second-hand cars. Used cars in the hands of the original owners will be insured for a percentage of the list price after allowing for depreciation, according to the rule printed in the rate sheet.

No cars are to be insured for a period longer than one year and authorization must be secured before dealers' lines and finance companies' business is written. New policies are to be declined on cars more than three years old, except under special authorization, while there is a long list of exceptions of cars manufactured before 1920.

Agents are required to decline insurance on cars unless they are personally acquainted with the applicant and his financial standing, and if there is any question as to his ability to own and maintain a car, the company is to be given the benefit of the doubt.

WILLIAM A. BLUME—ATTENTION!

Mrs. Arla Blume, wife of William August Blume, with her two-year-old son, is now living at the Chapman Hotel, Chapman, Kans., and is very anxious to hear from her husband, who was last heard from in El Dorado, Kans., where he was employed as an automobile mechanic. Mrs. Blume informs MOTOR AGE that her husband has always been employed in the mechanical department of the automotive industry and that he was a close reader of the pages of this magazine. Their former home was in Kansas City.

ROCHESTER TO REPEAT SHOW

Rochester, N. Y., Sept. 12—Rochester automobile dealers plan to stage another enclosed car show this year, probably the last week in October, at the New York State armory in this city.

CONCERNING MEN YOU KNOW

Ray W. Sherman, for many years editor of Motor World, and now merchandising director of A. E. A., has accepted an invitation to deliver an address at the annual meeting of the South Carolina Automotive Trade Assn., in Greenville in December.

A. C. Maucher who was connected with the Peerless and the Cadillac cars in Philadelphia for 15 years and lately with the Standard Steel Car Co. of Pittsburgh, in sales, advertising and production capacities, recently resigned from the latter company to become General Manager of the Ray Battery Sales Corp, New York City, distributing the Ray storage battery in the eastern part of New York State and northern New Jersey.

San Francisco—The 1921 report of the division of motor vehicles of California, just issued by Charles J. Chenu, chief of the division, shows 571,712 automobile registrations, 32,216 trucks and 15,752 motorcycles in the state.

Henry G. Shirley, Maryland, has been made chairman of the good roads' board of the American Automobile Assn., his new duties to commence at once.

Olin R. Smith, who for the past three years has been advertising manager of the Moto-Meter Co., Inc., Long Island City, N. Y., has joined the staff of the Palmer Advertising Service, New York City.

James S. Stevenson, vice president of the Kelsey Wheel Co., died here Aug. 30, after a two years' illness. He has been a resident of Detroit since 1887, joining Berry Bros., Inc., and later becoming general manager of that company.

Frank Johnson has joined the engineering staff of the Cadillac Motor Car Co. at Detroit.

C. C. Cottrell, former Nevada State Highway engineer, has assumed his new duties as manager of the good roads bureau of the California State Automobile Assn., in succession to Ben Blow, who resigned recently to become manager of the Victory Highway Association, with headquarters in Kansas City.

W. Clark Little, for eighteen months in an executive capacity with the Snodgrass & Gayness advertising agency of New York, has joined the Anderson Motor Co., Rock Hill, S. C., as advertising manager.

R. N. Hosher, head of the Michigan Oldsmobile Co., has resigned after 17 years' connection with the Olds Motor Works, during which time he served as comptroller and later in sales capacities. His plans for the future are not announced.

C. J. Kubach, president of the Kubach Construction Co., has been elected president of the Moreland Motor Truck Co., succeeding R. H. Raphael, who asked to be relieved after 11 years of service.

Buckeye Capitol Business Continues Good, Say Dealers

Columbus, O., Sept. 12—With the reduction in prices of the Ford, Overland, Oldsmobile, Chevrolet and several other makes, trade in passenger cars in Columbus has been stimulated to a marked degree. All of the dealers who handled the makes on which reductions were made, reported an increase in demand with business much better than was anticipated.

Other lines have been selling fairly well and dealers report a fair business. One of the things that strikes the dealer is the fact that the salesman have to go out after the business and that the hustler is the one that produces. In other words, there are fewer "drop ins" than formerly, and the dealer who wants to make a showing is compelled to hustle for prospects and for contracts.

The unemployment situation in Columbus has improved recently and this has the effect of instilling optimism into the dealers and salesmen. The feeling in industrial circles has improved since orders are not quite as hard to obtain as formerly. Prospects for the future are considered fairly good and dealers in passenger cars believe that the fall months will show a considerable volume of business.

A. M. GIBBES DIES SUDDENLY

Columbia, S. C., Sept. 12—A. Mason Gibbes, head of the Gibbes Machinery Co., Packard, Paige and Durant distributor in South Carolina, died suddenly in his office Sept. 6. Gibbes, whose company did an extensive machinery and foundry business as well as wholesaling and retailing automobiles, was one of the strong men in the industry in the southeastern states. He was one of the organizers and first president of the South Carolina Automotive Trade Assn., and was holding the office when he died.

Gibbes had been influential in bringing about legislation in his home state favorable to the industry, and through Senator Dial of South Carolina had exercised considerable influence on federal legislation. He had done a great deal of work to help elevate the tone of the trade in his home state. He was 44 years of age. A brother, Frank H. Gibbes, had been associated with him in the affairs of the company.

CHEVROLET REDUCES PRICES

New York, Sept. 12—The Chevrolet Motor Co. made the following price reductions for the 490 models, fully equipped, effective Sept. 3:

	Old	New
Touring	$625	$525
Roadster	625	525
Coupe	975	875
Sedan	975	875

ATLAS LOWERS PRICE

York, Pa., Sept. 10—Effective Sept. 3, the list price of the Atlas "Merchants' Dispatch" 1-ton truck is reduced to $1,550 f. o. b. York. This is the second cut in the price of the "Merchants' Dispatch" within a year, making a total reduction of $215.

STUDEBAKER DROPS PRICES

South Bend, Sept. 12—Effective Sept. 8, the Studebaker Corp. lowered prices on its light six models, ranging from $185 on the touring to $145 on the sedan. The new prices compared with the old are as follows:

	Old	New
Chassis	.....	$ 975
2-pass. road.	$1300	1125
Touring	1335	1150
Coupe road.	1695	1550
Sedan	1995	1850

DEFIANCE LOWERS PRICE

Defiance, O., Sept. 12—The Defiance Truck Co. has made price reductions ranging from $200 to $375. The 1-ton model now will sell for $1695 and the 2-ton for $2275.

Report Shows Steady Tire Production Increases

Rubber Association Figures Declare Manufacture Is Heavier, with Decline in Stocks

New York, Sept. 14—Statistics compiled by the Rubber Assn. of America on tire production, shipments and inventory, for the Department of Commerce, show a steadily increasing volume of manufacture and an equally steady decline in stocks on hand. The figures by months since November, 1920, which is taken as the base month, up to August, follow:

	Inventory	Production	Shipments
Pneumatic Casings			
1920—			
Nov.	5,880,016	649,742	806,023
Dec.	5,508,380	506,111	1,327,153
1921—			
Jan.	5,319,605	703,430	965,417
Feb.	5,193,018	819,892	1,073,756
Mar.	4,597,103	1,163,314	1,614,651
Apr.	4,527,445	1,651,418	1,785,951
May	4,451,668	2,100,917	2,085,882
June	4,154,456	2,313,265	2,643,850
July	3,892,037	2,570,524	2,757,581
Inner Tubes			
1920—			
Nov.	6,131,935	742,815	920,938
Dec.	5,786,929	508,446	1,481,285
1921—			
Jan.	5,586,163	740,824	1,042,617
Feb.	5,415,464	916,627	1,129,881
Mar.	5,044,861	1,346,483	1,643,690
Apr.	4,916,772	1,762,122	1,983,571
May	4,751,880	2,210,040	2,342,567
June	3,835,098	2,359,928	3,232,673
July	3,122,815	3,020,981	3,603,248
Solid Tires			
1920—			
Nov.	298,875	21,355	34,217
Dec.	303,473	16,297	40,828
1921—			
Jan.	303,753	21,220	29,116
Feb.	304,374	23,365	29,599
Mar.	283,800	28,710	43,926
Apr.	269,985	28,859	42,080
May	264,633	35,156	40,122
June	240,336	28,395	49,867
July	220,003	35,123	55,678

"Production" and "Shipments" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

MOON MAKES THIRD REDUCTION

St. Louis, Sept. 10—Effective immediately, Moon cars have been reduced to $1,785 on open models and to $2,785 on enclosed models. This is the third reduction, and brings these cars $600 lower than last fall prices.

BELL LOWERS TRUCK PRICES

Ottumwa, Ia., Sept. 15—The Bell Truck Sales Corp., sales division of the Iowa Motor Truck Co., today made a reduction on the complete line of Bell trucks. The company reports a capacity production on the light model, while a 75 per cent reduction is being maintained on the heavier models. The prices are:

	New	Old
Model M 1-ton	$1495	$1650
Model E 1½-ton	2100	2250
Model O 2½-ton	2550	2750

Would Use Congressional Recess to Court Solons

N. A. C. C. Advises Automobile Industry to Make Most of Month in Law Shaping

NEW YORK, Sept. 12—The National Automobile Chamber of Commerce has sent to its members a bulletin calling attention to the fact that the month's recess taken by Congress will give an opportunity to meet members of both Houses in person and present views on legislation which will be taken up during this session. From the viewpoint of the automotive industry the most important measures are the:

Phipps - Dowell - Townsend Highway Bill, which has been passed by the House and Senate, and now is in the hands of conferes. The measure as it stands carries an appropriation of $75,000,000 for one year for main highways.

The Taxation Bill, which has been passed by the House and is now in the hands of the Senate finance committee. As the measure now stands, it does not remove the excise tax on automotive vehicles, tires, parts and accessories.

The Graham Bill, which provides for the imposition of a 90 per cent ad valorem duty on all American made goods exported for use by the American expeditionary forces or allied governments, sold to other governments by the United States liquidation commission and later sold to speculators who have been reimporting large quantities to this country, including motor trucks and passenger cars. The measure was passed by the House and reported favorably by the Senate finance committee with an amendment which would limit its effect to goods purchased after Aug. 15 and reimported after Nov. 1, 1921. Passage in the Senate under unanimous consent was prevented by objections by Senators Pomerene and Hitchcock.

The Dyer Motor Vehicle Theft Act, which was passed by the Senate and reported favorably by the House judiciary committee, but passage by unanimous consent was prevented by Representative Mann, of Illinois.

20,000 USE CITY CAMP

Sacramento, Sept. 10—Twenty thousand persons have used the Sacramento public camp ground at McKinley Park so far this season, according to figures furnished by F. N. Evans, in charge of city parks. The population of the camp has averaged more than 100 persons daily, and arrangements are being made to increase the size of the park next year.

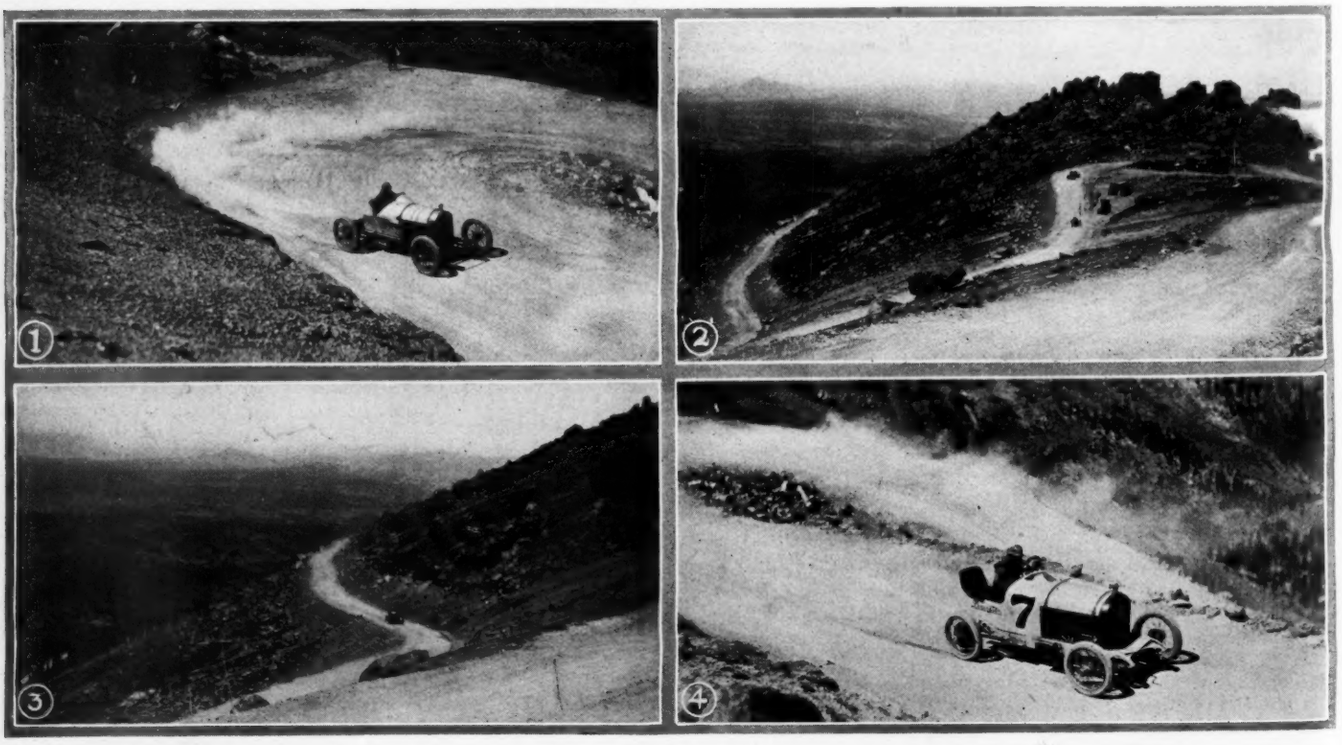
Fisk and Federal Rubber Companies to Consolidate

Stockholders Vote to Accept Proposition Which Also Includes Purchase of Ninigret Company

SPRINGFIELD, Mass., Sept. 14—Stockholders of the Fisk Rubber Co. and the Federal Rubber Co. have voted to accept the proposal of the directors for a consolidation of the two companies and the purchase of the Ninigret Co. The consolidation will take the name of the Fisk Rubber Co. The company will issue $10,000,000 in a first closed mortgage, a 20-year 8 per cent sinking fund, gold bonds at 99 with interest to yield 8.10 per cent. The bonds are uncallable until Sept. 1, 1931. During the life of the bonds, control of the company through the right to elect two-thirds of the directors will be vested in James Dean of Dillon, Read & Co., Otis H. Cutler, chairman of the American Brake, Shoe & Foundry Co. and H. T. Dunn, president of the Fisk Rubber Co. or their successors.

It is expected that consolidation of the Federal and Ninigret companies, which had been controlled through stock ownership with the Fisk company, will permit substantial economies.

Four Views of Pike's Peak Hill Climb Contestants



(1) Showing the daring manner in which Rhiley in his Hudson sped through the 60 curves of the course. (2) Race officials were stationed at frequent intervals and spectators lined the wayside pockets. (3) One of the cars on an easy stretch during the race Sept. 5. (4) Lexington, winner in class 2 for cars of 183 to 300 cu. in., driven by Otto Loesche

Tire Dealers' Association Names Cleveland Program

First Convention to Be Held Oct. 18, 19 and 20 Complete in Every Detail

CLEVELAND, Sept. 12—Invitations for the National Tire Dealers' Assn. convention have been mailed to more than 5,000 dealers throughout the United States. The convention is to be held at Hotel Winton, this city, on Oct. 18, 19 and 20. At headquarters of the association in this city, plans are being made to entertain 1,000 delegates. This will be the first convention of the organization, and the assemblage will be the first one composed strictly of tire dealers. The Cleveland branch is in charge of arrangements, and R. F. Valentine, of this city, is chairman of the committee on arrangements.

A very complete program has been arranged.

The Central Passenger Assn. has approved the application of the tire dealers' association for reduced fares, and a special rate of a fare and a half for the round trip has been granted. The instructions for obtaining the reduced rate provide that a one-way tariff fare at the full rate be purchased on any of the following dates: Oct. 14, 15, 16, 17, 18, 19 or 20. When purchasing the ticket, the delegate must ask for a certificate. This certificate will be validated when the return ticket is purchased, and the fare will be one-half of the regular rate for the return journey.

The program has been outlined as follows:

Tuesday, Oct. 18, 8:30 a. m. to 10 a. m.—Registration and assignment; 10 a. m. to 12 noon, morning sessions, attendance recorded; reading of minutes of formative session held in Chicago Jan. 30 to Feb. 2, 1921; report of president; report of board of directors; appointment of these committees: finance, nominating, auditing and resolutions; 12 noon to 2 p. m., luncheon; 2 p. m. to 4:30 p. m., report of secretary; report of treasurer; discussion of finances; recess.

Tuesday evening—Special demonstration of tire accessories and devices the dealer can employ in his business; the tire and accessory show will be open until 11 p. m.

Wednesday, Oct. 19—The entire day will be spent in Akron in inspecting the world's largest tire producing plants. It is planned also to send a delegation to Kent to inspect the only fabric mill in the Akron section. These two features will consume the entire second day.

Wednesday evening — The Cleveland branch of the National Association has arranged a program of stunts. The evening entertainment will be held in the Rainbow room of the Hotel Winton.

Thursday, Oct. 20, 9:30 to 12 noon—Reports of committees; reports of special committees; unfinished business; 12 to 2 p. m., luncheon; 2 p. m. to 4:30 p. m., new business; election of officers; discussion of topics.

Thursday evening—A banquet and musical program has been planned. There also will be entertainment by professionals. Two speakers of national reputation will talk.

A special ladies' committee from the Cleveland association will entertain visiting ladies on sight-seeing trips, matinee parties and concerts.

The tire and accessory show, which will be held in connection with the convention, promises to exceed the expectations of those in charge. Applications for space have been coming in rapidly. Tires of all makes will be on exhibit, and visitors will be able to see the new uses to which rubber has been put. It is planned to devote one evening to the demonstration of the different devices on display and to familiarize thoroughly the various delegates and visitors with their uses.

The board of directors of the National Tire Dealers' Assn. will meet in Cleveland Oct. 17 at the office of the association to consider appointments for various committees and to outline business details that are to be brought to the attention of the delegates.

TO HAVE ENCLOSED CAR SHOW

Columbus, O., Sept. 12—Taking the tip from a recent story in MOTOR AGE, the Columbus Automobile Trade Assn. has arranged for an enclosed car show, to be held at Memorial Hall, Oct. 10, 11, 12 and 13. The hall will be decorated for the occasion and it is planned to restrict exhibits to enclosed cars. While accessories will be displayed, they will be only those devices and accessories which go to help the operation of enclosed cars.

The committee on arrangements consists of H. M. McCord, president of the Columbus Automobile Trade Assn., chairman; Don Cole, E. C. Brisley, Horace Taylor, Price Kinney, Fred Kaiserc, I. B. Huffman, J. L. Thompson and J. S. Huff. J. T. Milar, manager of the Columbus Automobile Trade Assn., will be in active charge of the show.

LAW DELAYS BUS PURCHASE

Detroit, Sept. 14—Purchase by the city of trolley buses has been laid over until after the October election to permit an amendment to the charter. The present charter will only permit the railway commission to purchase the regular type of trolley car. An amendment to provide for the purchase of gasoline buses or other types of trackless trolleys will be substituted. A three-fifths vote will be necessary to pass the amendment.

GOVERNOR BACKS GAS TAX

New Orleans, Sept. 10—Governor Parker has announced that he will recommend a sales tax of one cent a gallon on gasoline to the special session of the Louisiana legislature now in session. The constitution permits a two-cent tax for road purposes.

CHEVROLET DROPS TRUCK PRICE

Detroit, Sept. 14—Price cuts have been made on the Chevrolet Model T, 1-ton truck and Model G, ¾-ton, the former from $1225 to $1125 and the latter from $820 to $745.

July-August Sales Dispel Gloomy Wall Street View

Midsummer Business Unprecedentedly Heavy Compared with Early Months; Truck Sales Increase

NEW YORK, Sept. 14—Pessimism which has been apparent in Wall Street for some time in regard to the automotive industry is not justified by actual conditions and has not been since March. August sales, exclusive of Ford, were 70 per cent of sales for August last year and were 2 per cent in excess of July. Business for July was 7 per cent better than in June. Ford sales for this period were larger than ever before in the history of the company.

Prospects are that with Ford, Dodge, Buick and Studebaker as leaders, sales in September will be on a par with those for August. In comparison with other midsummer sales of passenger cars this season's sales were almost unprecedentedly large in relation to the earlier months.

While the commercial vehicle branch of the industry is still at low ebb it is gradually improving and there has been apparent in the last few weeks a considerably increased demand for light delivery trucks.

Not only was the vehicle manufacturing end of the business better in August than in July, but the same was true of parts and accessory manufacturers. July for them was slightly better than June and August slightly better than July. New orders and releases already received for this month indicate that there will be no falling-off. Gradual reduction in tire production may be expected as the touring season comes to an end.

Purchasers of automobiles are being given the benefit of lower manufacturing costs resulting from wage reductions, greater labor efficiency and lower cost of materials. Keener competition also is a factor in price reductions on cars and trucks.

Price Stabilization Necessary

Retailers and distributors are hopeful, however, that whatever price adjustments remain to be made will be put into effect at once, for they believe price stabilization is necessary before there can be stabilization of sales.

In some sections dealers expect the belief of prospects that there will be further price reduction, may interfere somewhat with September sales. There is general expectation that after this month business will gradually taper off until the show season in January, but this is a perennial condition. There is in prospect an unusually heavy demand for enclosed models of passenger cars. The large number of new models which will be brought out this fall by makers of popular lines also is expected to stimulate sales. These two factors will prevent anything in the nature of a disastrous slump.

Attribute Increased Sales in Texas to Salesmanship

August Better Than July, with Prospects for September Pointing to New High Mark

DALLAS, Tex., Sept. 10—The Automobile business in Dallas and north Texas showed a decided improvement during the month of August, local retail dealers declare. This was especially true in the sales of medium priced cars. Truck dealers also reported improved business. Accessory men, tire dealers and garagemen reported the past month to be the banner month of the year with them. Retailers of high-priced cars stated that while sales have not materially increased with them, they have held their own and that the outlook for the fall is exceedingly bright. Disposition of the grain crop at fairly good prices, moving of the cotton crop, reduction in prices of cars and employment of only salesmen who can and do deliver the goods are among the reasons assigned for the increased business in this section of the country.

Following is what the leading automobile men of Dallas say about the business in August and the outlook for the fall:

Medium-Priced Cars Being Sold

William Morriss, president of the Texas Automobile Dealers' Assn.—"The automobile business is swinging back to normal, not only in Dallas, but in other large cities of the state. There has been no wild onrush of prospective customers, eager to buy, but medium-priced cars are being sold wherever dealers are using real salesmen."

J. H. Connell, president of the Dallas Automotive Trades Assn.—"Territory business has picked up where dealers have gone after the business with proper arguments and the 'goods.' It will continue to grow better as cotton is marketed. The financial strain has been relieved and the buying will continue."

W. E. Taylor, manager of the Chevrolet Motor Co.—"August was a better month for sales than any since last September. We sold 18 cars at retail last week. That was about the month's average."

S. G. Davis, distributor for the Oldsmobile—"August was the biggest month of the year with us. We sold nine cars last week. That was about the average for the month. There is no such thing as the saturation point in the automobile business. Progress and prosperity means more cars. We expect to continue selling them in larger numbers."

Tenison & Bair, Marmon, Maxwell and Chalmers dealers—"August sales exceeded those of the same month last year. We are expecting business to continue to show an increase."

William Morris, Hudson and Essex dealer—"August was the banner month of the year with us. We expect better business during the fall."

J. H. Sheldon, Ford dealer—"Our August sales were as good as those for July, when we set a record. Business for September looks even better."

Trinity Motor Co., Dodge Brothers distributor—"August business was the best of the year. We are back to normal. Looks as if business for the remainder of the year is going to show more improvements."

Nash-McLarty, Nash dealers and distributor—"August business was up to the normal mark. Business is picking up weekly. It looks as if this fall will be banner business for automobile men."

Cadillac and Packard dealers reported their business was holding its own and that the outlook is brighter. A score of other dealers making reports said the business was about all that could be expected and that they expected better business during the next three months.

A half dozen truck and trailer men reported sales increasing as farmers and ranchmen rounded in financial shape to make purchases. Tractor men said business except in the Panhandle and north Texas, has been slumping. In those sections an increase has been registered.

Car Sings Its Own Praise in Ohio City

TOLEDO, Sept. 10—Toledoans were astonished the other day when a Willys-Knight, known as a particularly silent car, rolled up to the curb and began talking about itself.

It was one of the new stunts the Willys-Overland, Inc., city sales was introducing to bring attention to its drive for business. The car had a phonographic arrangement located under the hood. It was claimed that the car would "speak for itself."

The hood was of glass so that the parts of the engine might be easily seen. The driver left the car standing at the curb and then it began to do its own talking.

"I am the Willys-Knight," the car shouted out. "I am equipped with a Knight engine of sleeve valve design. Mine is the only motor in the world that improves with use—"

And so it went on selling itself to the crowd. The stunt attracted a great deal of attention in the busy downtown streets, where parking is permissible.

CAMP REGISTERS 5640 CARS

Spokane, Sept. 10—The development of motor touring to the Pacific northwest is one of the conspicuous features of the industry. Spokane, for example, maintains an attractive motor tourist camp which affords a means of gaging the volume of travel by automobile. In 1920 a total of 4402 cars registered at the park. This year, up to Aug. 15, 5640 cars had used the camp, and the peak of the travel was reached in the closing weeks of August.

Ohio Jobbers Optimistic Over Local Trade Promise

Association Meets to Arrange Annual Convention and Show; Supports Trade Association

COLUMBUS, Sept. 12—A meeting of a majority of the members of the Ohio Accessories Jobbers' Assn. was held recently to discuss conditions in the accessories trade and to answer the questionnaire sent out to the various associations by the Federal Board of Commerce. In all, eight of the twelve firms included in the membership of the state association were represented. The questionnaire was discussed at length and answers were given to the various questions.

A discussion of trade conditions showed that jobbers have been having a very satisfactory trade, when unsettled business conditions are taken into consideration. None of the jobbers had any complaint to offer and all agreed that the worst of the slump is over and that conditions will likely improve from this time on.

H. H. Brennen, Cincinnati, is president of the association; Curtis Sohl, Columbus, vice president; C. H. York, Greenville, secretary, and Charles E. Justus, Columbus, treasurer.

The association went on record to support the coming meeting of the Ohio Automobile Trade Assn., which is scheduled to meet in Columbus, Dec. 12, 13 and 14. Arrangements are being made for a large exhibit to be held at Memorial Hall and the Ohio jobbers will participate in the various accessories displays. The annual meeting of the Ohio Accessories Jobbers' Assn. will be held in Columbus at the same time as that of the other organization.

FAIR BOARD HOUSES CARS

Fresno, Sept. 10—The brick building erected by the Fresno District Fair Assn. to house the automobile show this year is completed. It is of one story, 150 by 175 ft., the largest building designed for automobile shows in California. The cost was $30,000.

FLIERS TO MEET AT KOKOMO

Kokomo, Ind., Sept. 10—Arrangements have been completed for the National aviation meet, being promoted for Sept. 22, 23, 24, which will bring to Kokomo hundreds of fliers and airships, and thousands of spectators. This meet will be approved by the national body and the contests and trials will be official. Stunts, parachute drops and all manner of flying thrills will contribute to the program.

The meet will be on the field of the Curtiss-Indiana company, state distributor of aircraft. Entrants in many of the events have national reputations, war records and international fame. Half a dozen new planes, including that equipped with a motorcycle motor, weighing 350 lbs., with a wing spread of 21 ft., will take part in the meet.

BUSINESS NOTES

Victor Rubber Co.—District managers of the Victor Rubber Co. who gathered in Springfield, O., recently, reported that the rubber tire business is good and that prospects are bright for business this fall and winter.

Those who attended the conference and luncheon were: H. S. Berlin, president; E. H. Durr, secretary-treasurer; A. L. Feich, advertising manager; C. A. Swinehart, sales-manager; C. L. Armstrong, branch city manager, all of Springfield. F. D. Grant, Chicago; C. G. Raco, Los Angeles; F. C. Braden, New York City; Ira Stowe, southern manager and B. V. Howard, Kansas City.

W. J. Benson Co., Stephens representatives in northern California, has extended its franchise to cover the state of Nevada and the Hawaiian Islands, as a result of Benson's personal work with the Stephens Salient Six in northern California.

Franklin Automobile Co.—According to a statement issued today by officials of the Franklin Automobile Co., shipments from the Franklin factory during August exceeded shipments during August, 1920, by 25 per cent.

McKay Carriage Co., Grove City, Pa., has completed a new addition to its plant which will more than double capacity. This building will be used for manufacturing of bus and school bodies which the company manufactures for all types of chassis.

Loring P. Lane, of Westfield, Mass., has been appointed trustee in the estate of the Federal Corp., local manufacturer of automobile accessories, as a result of the first hearing of the corporation's creditors before Referee Charles W. Bosworth in bankruptcy court at Springfield. Liabilities of the corporation are listed as $282,908.27 and assets at $62,544.08.

Severin Motor Co.—Construction on the first building of the Severin Motor Co.'s factory in Oakland, Calif., will start on or before Sept. 15, according to an announcement made here by Maury L. Diggs, architect in charge of the building of the new plant. The first unit, according to Diggs, will be 60 by 450 ft. When completed, the plant will cover an area of four acres, and have a capacity of 20 cars a day. The company is moving to Oakland from Kansas City, where the factory has been making cars for three years. Equipment of the Kansas City factory is expected to arrive here before the end of December. The company is capitalized for $1,000,000.

Gove Motor Car Co. construction has begun at Thorold, Ont. Production of cars is to begin immediately upon completion of the plant, it is said.

H. M. Smith and Ralph Reser have been named as receivers for the Master Motor Co., one of the largest automobile selling concerns in Lafayette, Ind., action having been asked by the Firestone Tire & Rubber Co. According to the company's statement for July 1, its assets exceeded its liabilities to the amount of $31,000.

Martin Tire.—The regular semi-annual dividend of 4 per cent on its preferred stock has been declared by the Martin Tire Corp., New York, payable Sept. 20 to stockholders of record Sept. 10.

Parenti Motors Co.—Police have discovered a fake issue of Parenti Motor Co. stock. Purchasers of the fake stock have turned in a worthless, counterfeit issue which they purchased from a man who gave his name as John Crossman, Chicago. Officials of the Parenti corporation discovered the counterfeit issue through inquiries which followed sales in Tonawanda, N. Y.

COURT STUDY STOPS ARRESTS

Indianapolis, Sept. 10—Appeal from the superior court decision of Judge Moll to the supreme court for a ruling on the constitutionality of the Indiana automobile license and registration law has been filed by W. S. Frye, motor transport operator. Eighteen cases pending against Frye were thrown out of court recently, just prior to the expiration of the 1913 statute under which they were filed. The last case was a prosecution under the 1921 statute effective in July. When this case was begun state, city and county authorities began wholesale arrests and prosecutions against truck owners and operators, and more than 250 arrests were made. More arrests were prevented by a temporary restraining order granted by Judge Moll, which was dissolved last week by the decision upholding the state law.

The attorney-general and county prosecutor have agreed not to start more arrests and prosecutions while the case is pending in the supreme court. The truck operators complain that the license fees averaging $5 per ton were prohibitive and discriminatory in favor of other vehicles not required to pay for licenses.

PENNSYLVANIA PAYS GAS TAX

Philadelphia, Sept. 10—Since Sept. 1 Pennsylvania motorists have been paying 1 cent a gallon state tax on gasoline. Gasoline station managers have been instructed to keep an accurate account of all sales and make prompt returns to the state authorities. Gasoline is now selling in this city at 23 and 24 cents. The tax is to be added to the ordinary price.

Failure to make monthly returns to the department of the state auditor general, or refusal to permit employees of that department to examine a dealer's books, subjects him to a $1,000 fine, or six months' imprisonment, or both. Agents of the state who violate the confidential nature of such information are subject to similar penalties.

One-half of the proceeds of the tax goes to the county in which the tariff is collected, to be used solely for construction, or repair of roads, or payment of road bond interest. The other half goes into the state treasury.

Excise Tax on Automobiles Drops $28,377,031 in 1921

Washington, Sept. 12—Tabulation of total collections of internal revenue from all sources for the fiscal year 1921 show a decrease of $28,377,031 in the excise tax on automobiles from the figures for 1920, when this form of taxation brought in $143,922,792.

Carried out in detail, the payments of automobile excise taxes follow:

1920—Trucks and automobile wagons	$14,471,464.32
1921—Trucks and automobile wagons	11,640,051.98
Decrease	$ 2,831,412.34
1920—Automobiles and motorcycles	$76,315,814.26
1921—Automobiles and motorcycles	64,388,105.80
Decrease	$11,927,708.46
1920—Tires, parts, accessories	$53,135,513.43
1921....Tires, parts, accessories	39,517,602.60
Decrease	$13,617,910.83
Total decrease	$28,377,031.63

12,000 Petitioners Ask City of Rockford for Bus Lines

Street Car Company Cannot Meet Expenses with Eight-Cent Fares; Buses Make Money

ROCKFORD, Ill., Sept. 10—The fight for supremacy between the Thomas Fay Motor Bus and Truck Co. and the electric street railway company of Rockford, Ill., bids fair to end in the victory of the former. The city council, by a vote of 8 to 7, accepted a committee report, approving an extension of the bus line to all parts of the city with a five-cent fare and two-cent transfer.

The legal department was instructed to prepare an ordinance, and it is predicted that this measure will carry by the same vote. The presentation of petitions, carrying 12,000 names, asking the council to favor the bus line, turned the tide in favor of the motor vehicle company. The argument of the bus line supporters is that if the street car company cannot meet operating expenses at the present eight-cent fare, that it should go out of business.

The street car company belittles the so-called "jitney operators," asserting that there are 25,000 operating in the United States. The Fay company admits this, but counters with the argument that a bus line, properly organized to give service and protect the public soon puts the irresponsible and unreliable jitney operator out of business, as was the case when the Fay company became organized in Rockford. In Rockford 240 jitneys were being operated when the Fay company was organized. All were frozen out, not through recourse to law for the removal of such competition, but through improved and cheaper service.

At Saginaw and Bay City, Mich., where the street cars lost money at a 10-cent fare, the bus lines solved the transportation problem, supplying service at five cents.

The Fay company guarantees the public more expeditious service than possible with the street cars, and at less money. It is promised that the people will be saved $150,000 in transportation costs per annum if the buses are operated exclusively. It is maintained that if the city of Rockford is to continue with tracks occupying one-half of the principal streets that eventually it will be necessary to widen the thoroughfares to take care of congested traffic. Many argue that the traction line has become out of date and should be supplanted by the flexible motor bus.

The Fay Motor Bus Co. is not asking, however, that the traction line be eliminated; it is not asking for a franchise; it is not tying up the city with a proposition for a period of years. It is simply asking the council for an opportunity to demonstrate that real motor bus service can be given to a city the size of Rockford and make it the first in the United States to adopt such a complete service of motor vehicles.

St. Louis to Have Big Fall Exposition of Automobiles

Chevrolet Plant of General Motors Will House Dealers' and Makers' Show in October

ST. LOUIS, Sept. 12—Realizing the necessity of focussing the attention of the public on passenger and commercial cars, the St. Louis Automobile Manufacturers' and Dealers' Assn. has decided to hold an automobile exposition in St. Louis from Oct. 15 to 22, inclusive.

Through the courtesy of the local Chevrolet branch, the immense plant of the General Motors Corp. has been placed at the disposal of the dealers for holding this fall exposition.

For the first time in years, sufficient space will be available to give adequate display to passenger cars, commercial cars and accessories. The week of Oct. 15 to 22 was chosen because of the great number of visitors who will be in the city at that time attending the St. Louis celebration of the Missouri centennial, which will draw thousands of people from surrounding territory.

The success of the exposition and the interest in motor cars it will engender should have an important bearing on fall and early spring business of the motor car industry, not only in St. Louis but throughout this section of the country.

It is planned to open the exposition Saturday, Oct. 15, at 2 p. m. and close Saturday night, Oct. 22, with an intermission of one day on Sunday. Robert E. Lee, secretary and general manager of the dealers' association, will be manager of the show, and H. W. Spaulding, manager of the Chevrolet Motor Co. of St. Louis, is chairman of the show committee.

TRADE ASSOCIATION IN GENEVA

Buffalo, Sept. 10—The Geneva Auto Trades Assn., Inc., has been organized at Geneva, N. Y., to promote the interests of automobile and accessory dealers and service men of that city and vicinity. One of the first undertakings of the new association will be to put the sale of automobiles, accessories and service on as nearly a cash basis as possible.

The association was formed in 1917 to conduct an automobile show in Geneva, but was discontinued when the United States entered the war and has just been revived and incorporated.

The new officers are: president, B. L. Adams; vice president, David Moore; secretary, M. B. Grubb, and treasurer, M. J. O'Malley.

SHIP REX TRUCKS IN BOXES

Chicago, Sept. 10—The Royal Rex Motors Co., Chicago, building motor trucks and motor buses, is featuring a new departure in truck shipments between the factory and dealers. The outstanding feature is the shipment of trucks in boxes and cases instead of total units. By the use of this method, the transportation charges are very materially reduced and the shipments are arranged and packed in such a way that the truck can be assembled at the point of destination with a minimum amount of time and labor.

Aside from the shipping features of the trucks, there are several other up-to-date features. The chassis are in 1, 1½, 2, 2½, 3½ and 5-ton capacity. The intake air purifier for the purpose of eliminating dust is one of the engineering points. The frame is assembled without rivets, has no holes in the top web of the side rails and has a subframe of wood. The engine is supported in a steel cradle, which in turn has a three-point suspension.

Car Swappers Hold Bee in South Carolina

COLUMBIA, S. C., Sept. 10—When it comes to "pulling" something entirely new, whether it be a pellagra scare, boll weevil invasion, mob chase or cotton deflation, South Carolina takes first rank, and she has recently added to her reputation for originality by an Automobile Swappers' Convention which was held for three days this week at Pickens, this state.

Horse swappers' conventions are more or less common; on these occasions horses and mules in every stage of decrepitude are brought to one central point and the owners proceed to swap them, making the best bargains possible. The Automobile Swappers' Convention was modeled on exactly the same line except that cars were substituted for animals.

Early on the opening day of the convention automobiles of almost every make, every size, all ages and colors, began to arrive in Pickens, and in a short time there was such a swapping going on as is not often seen. Men who had had years of sharpening experience in trading horses exhausted their vocabularies in extolling some car which, for some reason or other, they wished to be rid of. This automobile swapping convention, in session three days, is said to be the first held in the United States.

WILLIAM A. PATERSON DIES

Detroit, Sept. 12—Through the death of William A. Paterson in Flint last week, one of the notable figures in the automotive and, preceding it, the carriage-building industry, has passed away. He was the founder of the W. A. Paterson Co., manufacturer since 1869 of carriages and since 1908 of the Paterson automobile.

Mr. Paterson was born in Fergus, Ont., in 1838. He came to Flint in 1869.

The carriage business was discontinued in 1910, two years after his advent into the automotive field. Affiliated in the company with him were W. C. Paterson and W. R. Hubbard. No action will be taken on filling the presidency for the present.

Holds Lien on Car for Service Charges Illegal

Kentucky Judge Holds That Old Law Is Repugnant to State and Federal Constitutions

LOUISVILLE, Sept. 10—Holding that a law giving special privileges to persons conducting the business of repairing motor vehicles, by authorizing the enforcement of a lien without legal procedure, is repugnant both to the state and federal constitutions, Judge W. H. Field yesterday declared Section 2739-h of the Kentucky statutes to be unconstitutional.

The ruling was in an action instituted by John G. Maxwell for the recovery of an automobile which is owned by him on which repairs had been made by Meadows & Pritchett.

It was admitted in an answer filed by the latter firm that it was their purpose to sell the car without the formality of an action in equity for the enforcement of the lien, but to be guided by the legislative enactment conferring such powers on automobile repairmen.

A radical departure from the common law is attempted in the second subsection of the enactment, Judge Field said.

"In this subsection the legislature has selected from the general body of artisans who may at common law enforce their liens for compensation through suit and judicial sale of the chattel in lien, those particular artisans who repair motor vehicles, and has attempted to give this selected class alone the right summarily to enforce their liens by non-judicial sale."

Judge Field said Section 59 of the constitution of Kentucky and the Fourteenth Amendment of the federal constitution secures to all persons within the jurisdiction of any state the equal protection of its laws.

"None of those great fundamental principles of civil liberty, established through tumultuous centuries, should be more jealously guarded than that of equality of rights and responsibilities," the court said. "Few are subject to more insistent attack or more insidious evasion. In my opinion, Section 2729-h is repugnant to both the state and federal constitutions as special legislation, benefiting a few and discriminating against all others similarly situated."

Although the law has been on the statute books for several years, this is the first time it has ever been questioned by an automobile owner. It was said the case now will be taken to the court of appeals for a review of the ruling.

NAMES TIRE STANDARD COMMITTEE

New York, Sept. 12—The Rubber Assn. of America has appointed a special committee to investigate the possibilities of formulating and adopting a table of tire standards for use on motor wheels. A report is expected in the near future.

Better Business
Money-making Ideas

A dollar will be paid for all ideas accepted as Better Business — Perhaps you have some

Reaching Rural Motor Owners

A Montana tire and accessories shop uses every possible plan to build up a patronage among its country prospects. One plan was to place at the front of the store each week-end a table on which was arranged a display of some one article selected as the "special" for that week. These specials are always advertised in the local newspapers and also shown in the windows. The entire stock of them is then placed on the display table to catch the attention of patrons who come in. It is found that when they come in response to the appeal of a special they usually tarry awhile and often buy other merchandise.

Various outfits and specialties—one article each week—that do not replace any of the staples are offered in this way, always at a reduction from what the regular price would be. While one car owner may not be interested in the special offered this week, it is likely that next week or the week after he will be interested, and come in.

On Saturdays there is always a line-up of country cars down both sides of the street and on most of the side streets. The dealer has printed up cards of his special with a list of his other goods following. A boy from the store takes a supply of these and walks along the curbing where the cars are parked, putting a card in each car.

None of these cards are passed by. Curiosity causes the car owner to first pick up the card to see what it is about. Then his eyes cannot miss the attractively featured special thus advertised. Seeing that, he becomes interested and is likely to note the other offerings.

Making an Old Radiator Bring Business

What is an old radiator with 500 leaks in it worth? Not much unless you use it as one dealer did when he placed it in a pan in a window and connected it up to city water. Little streams of water were poured forth in every direction. In fact, it made a pretty fountain. Anyhow it stopped nearly every by-passer and before they got away they had read the sign that invited them to bring their radiator to them to be fixed when it acted in this manner.

Coupon Books Bring New Customers

To stimulate the sale of the two lines of oil the company carries, and at the same time to bring its tire, accessory and service departments to the attention of a larger number of automobile owners, the Scholder Tire & Accessory Co., of Birmingham, Ala., issues a book which contains 20 printed coupons, each one good for a quart of oil.

Attractive hand-bill placed in car interests owner in special sale

The book is sold to the automobile owner for $5 and he obtains the 20 quarts of oil in this way for $1.50 less than it would cost him without the coupon book. In addition, the company offers free service to all bonafide holders of these coupon books at any hour of the day or night. This includes tire service, mechanical service, battery service, etc. The plan has been extensively advertised and has resulted in the sale of numerous coupon books, and in securing many new customers.

Accommodations Attract Tourists

An Indiana garage proprietor who is located in a small town on one of the most traveled highways in the state has erected large signs for a considerable distance on either side of the town reading as follows: "Comfort stations and rest rooms at Smith's Garage, Brampton."

Naturally these signs attract the tourist's attention and draw people to the garage. There is a hint in this for other garage owners.

Sold Oiling Service by Displaying Worn Parts

Realizing that the car owner dislikes repair bills, we boosted the idea of keeping the car greased. We secured a few worn out universal joints, shackle bolts and other parts which had been worn out for lack of grease and mounted them on a display stand on the service car. When on a job or on the street it always brought some talk and many new customers.

Business for Paintshops

Many dealers are finding that second hand car sales are rather slow and that their paintshop is not getting much business this summer.

To overcome this state of affairs, one Iowa dealer lists his customers' cars for sale and in many cases induces them to have the cars tuned up and painted so that they will sell more readily. He has sold several such jobs and in many cases sells a new job to the customer for whom he has sold a car. No charge is made for listing or selling the car if it has been tuned up and painted by him.

Offering "Service Plus"

A unique trademark of a tire shop is, "What Is Service Plus?" with a "plus" sign at the beginning and end of the sentence. The company having this trademark is the Service Plus Tire Shop of 2200 Fairfield avenue, Fort Wayne, Ind. The company has also adopted the following motto: "A Tire Shop With a Business Conscience." The plus service rendered by the company consists in giving the utmost of courtesy and attention to all customers.

Teaches Board Meaning of Word "Service"

"All We Have to Sell is Service" reads a sign on the wall of the Iowa Hassler Co., of Des Moines, Ia. Other signs read "Service Not Self" and "This is a Home of Service." Many employees have forgotten that we are all supposed to render a service, and may be reminded in this way; thus the concern is no doubt getting some dividends from the signs within their own organization. Is it not a good time to sell every one the big meaning of "SERVICE?"

Service Until Midnight

The car owner who comes into the battery station of the Fuller Storage Battery Co., Hartford, Conn., sees this sign: "At your service until midnight." And he remembers it.

The Readers' Clearing House

Questions & Answers

CONDUCTED BY WM. H. HUNT

UTILIZING OLD APPARATUS FOR GENERAL COIL TESTING

Q—We seem to have considerable trouble in testing coils. The only way that we can be certain that the coil is at fault is to remove it and replace it with a new one. If the engine works alright we know that we have located the trouble. However, a new coil is not always at hand and we would like to rig up some sort of apparatus to test the one which is giving trouble.

2—We have a motor-driven Leece-Neville generator from an old Haynes car, with breaker point and distributer assembly complete. We also have the necessary batteries and would like some plans for connecting the apparatus up in such a way that coils can be tested on it.

3—Can this equipment be used for such tests as the proper widths of spark plug gaps?

4—How much of a gap should the spark jump in the open to equal the compressed gas condition in the cylinders?

5—Publish the name of a book containing wiring diagrams of all makes of cars and giving the charging rates of generators.—Carl A. Hallen, Kansas City, Mo.

1—This is, of course, the final test of any coil. If it works satisfactorily on the engine, it must be alright.

2—The old Leece-Neville apparatus can be rigged up very nicely to make the test. There are three forms of coils used extensively. These are illustrated in Fig. 1 marked 1, 2 and 3. The first one (No. 1) has three primary terminals marked A, B and C. This construction is used a great deal in the Connecticut and Remy coils. Although the positions of the terminals may vary somewhat, the internal arrangement of the coils is practically identical with that shown in the illustration.

In testing this coil, the first thing to be determined is which of the two terminals A and B lead to the primary winding. This may be determined with a battery by striking the end of the test leads on the terminals. No current will flow between A and C nor B and C, but a heavy flash will be drawn when the wires are touched on A and B. This then gives the starting point.

Part four of Fig. 1 shows the suggested hook up of the battery, coil and breaker points of the Leece-Neville outfit. It will be seen that a wire leads directly from the battery to point A of the coil. From terminal B of the coil a wire is led to the stationary breaker point of the Leece-Neville circuit breaker. Another wire, attached to any part of the metal shell of the circuit breaker is then led back to the battery. The path of the current is then from the battery through the primary winding of the coil through the breaker point and back to the battery through the last mentioned wire.

The next important point is to so connect the coil to the breaker mechanism that the condenser (shown in coil No. 1) will be connected across the breaker point. Again referring to part 4, lead a wire from coil terminal C to any part of the metallic breaker box. As the breaker lever is grounded it will be seen that the wire supplies the necessary path for the current between the points and the condenser. Nothing remains now but to connect the secondary winding of the coil to the spark plug or any suitable spark plug. Again referring to coil No. 1, it will be seen that one end of the secondary is connected to the metal bottom plate. This is varied sometimes by connecting it to a metal ribbon on the outside of the coil cartridge. Connecting up to the plug is very simple. Lead a piece of heavy secondary wire from the coil high tension terminal, be it on the side, bottom or other location, to the spark plug terminal. Lead another wire of any size or material from the bottom of the coil cartridge or from the metal ribbon on the side to the shell of the plug.

You are now ready to make a test. Start the apparatus and note the quality of the spark passing the points of the plug, which should be a new one. If the spark is firey, showing glints of purple or purplish red flame, the coil is normal. If the spark is thin, thread-like and whitish or very light blue and there is a snappy spark at the breaker points, the indication is that the condenser is punctured.

This can be checked by means of an extra condenser such as that used with the Delco system or one which may be purchased from any of the dealers in automotive electrical supplies. It is to be connected into the circuit, as shown by the dotted lines in part 4. If connecting the condenser in, as shown, betters the quality of the spark, it may be assumed that the condenser is defective and it should be replaced with a new one or the coil discarded.

Coil No. 2 is practically the same as coil No. 1, with the exception that it has but two primary terminals. All connections, with the exception of that of the condenser, are as for coil No. 1. It will be noted that the condenser and the secondary windings are grounded at the same points. In order to connect the condenser across the breaker points, it will be necessary to lead a wire from the metallic bottom plate of the coil or the grounding strip on the side to any part of the metallic breaker box. This will have the effect of connecting the condenser across the breaker points.

The tests are run the same as for No. 1. Should the condenser be suspected, the test unit can be connected into the circuit between terminal B and the metallic bottom plate of the coil or the side grounding strip.

Coil No. 3 is again slightly different

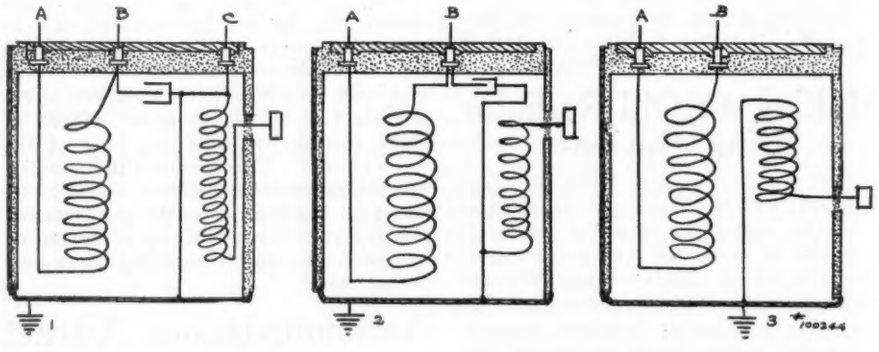
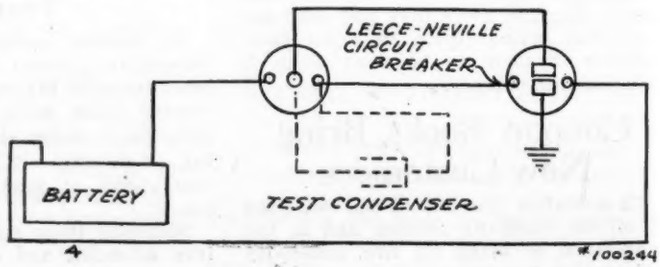


Fig. 1. Above—Windings and connections of the most commonly used ignition coils. See also Fig. 5.



Below—Suggested method of wiring a three terminal coil for testing.

in that there is no condenser in it. This is the type of coil that is used with the Delco system, having the condenser on the side of the distributer unit. The connections are the same as for coil No. 1 and 2, and the condenser connection is the same as for coil No. 2. With this coil the condenser must be used to get results.

Although condensers can be tested with 110-volt current, the foregoing tests are more reliable as, if the coil will deliver a good spark when connected to a known normal condenser and will not give a spark when the condenser is disconnected, the proof is conclusive that the coil condenser is defective.

It may seem that we lay a great deal of stress on the condenser test. This is true for the reason that condenser failure causes about 90 per cent of coil failures; therefore, when testing coils the condenser is always suspected. While open and short circuits in the coil windings do sometimes occur they are comparatively rare and need hardly be considered.

After all, it is not so important to determine what the trouble may be as it is to determine whether or not the coil is in good working order, for the reason that it does not pay to attempt to repair coils. The cost of such operation invariably exceeds the price of new ones. The foregoing test will show conclusively whether the coils are in good working order and this is the principal point it is desired to know in the great majority of cases.

Many coils are equipped with resistance units. If current cannot be passed to the coil through the regular terminals it may be suspected that the resistance unit is burned out. This can be determined by touching a test wire to the central nut which holds the unit in position. This has the effect of cutting the unit out completely and sending the current directly to the primary windings. If current does not flow, the indication is that there is a break between the resistance unit screw and the end of the coil winding inside the cartridge.

4—The spark should jump a distance of from ⅛ to ¼ in. in air, and should be of good quality, rich and firey.

5—Such a book is marketed by the Associated Electric Service Stations, suite 412, 105 W. Monroe St., Chicago.

ELECTRIC LEAD BURNING ENTIRELY SUCCESSFUL

Q—Do you consider the electric burning on process for storage battery connections successful?—Victor R. Schumacher, Dixon, Ill.

The electrical process of lead burning has always been successful when used by an expert or someone having a thorough knowledge of the job. Many battery men complain that the jobs are not quite as smooth as those done with the hydrogen, city gas, acetylene gas and oxygen flames. Though this may be true, the joint is just as solid when burned electrically as when burned by gas.

There are two ways of doing electric burning. One is to draw an arc and, maintaining it, flow the lead in where required. The other is not to raise the carbon point from the work but to hold it on lightly and use it as a puddler to flow the lead and fuse the parts together. In the latter case no arc is drawn, but the pencil of carbon becomes red hot.

When using direct current, the carbon pencil should form the negative terminal as, if it is used on the positive wire, it has a tendency to drive the burned joint full of microscopic particles of carbon. This effect is not so pronounced when alternating current is used.

The rest of your queries are being replied to by letter.

The Readers' Clearing House

THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by someone else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

Emergency inquiries will be replied to by letter or telegram.

WANTS TO MAKE FAMILY SPEEDSTER OF HUDSON

Q—Publish a wiring diagram of the model "J" Hudson.

2—Also furnish a plan for cutting down the touring car to a racer or speedster with two seats and two small extra seats for children in the rear? Would it be practicable to use the old hood and cowl and build back from there?—N. C. Brown, South Bend, Tex.

1—See Fig. 2.

2—We do not have the dimensions and specifications of this chassis and naturally cannot design the body you require. Such a body incorporates most of the ideas and personality of the designer, and we believe you will do well to use your own ideas, sketching them out as plainly as possible, and have the body made by a local body builder or sheet metal shop. It should be entirely practical to carry the new body back from the original dash and cowl.

A SIMPLE FORD COIL TESTER IS WANTED

Q—Where may a device, other than a magneto assembly, for testing Ford coils be procured?—(Upon request of the inquirer his signature is withheld.—Ed.)

Several concerns supply simple devices for conducting tests using batteries, and one manufacturer of electrical meters supplies a low reading alternating current ammeter with which the magneto current may be used. The advantage of the latter method is that the coils may be adjusted with the current from the magneto with which they are to operate. The names and addresses of the several manufacturers are being sent you by mail.

PREVENTING CORROSION OF POSITIVE BATTERY TERMINAL

Q—We have occasion to examine the batteries on many of the cars which come into our garage. Invariably the positive terminal is found to be badly corroded and covered with a thick green, greasy deposit. Advise us how to remove this with soda and how to prevent its formation.—Ariel G. Olson, Milwaukee, Wis.

The corrosion is caused by acid seepage past the sealing around the positive post. Unless the pillar posts are properly designed there is no way of stopping the leakage. A makeshift method that gives fair results is to cut a groove in the post just above the cell cover and fill it with grease. A simpler method is to keep the parts well coated with grease. A saturated soda water solution will clean the deposits away as will ammonia also. Care must be exercised to prevent the solution from getting into the cells.

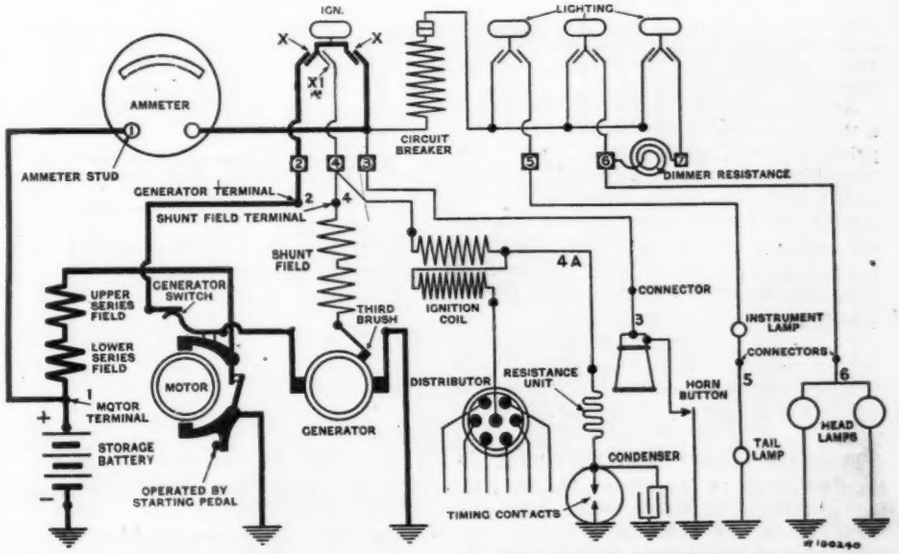


Fig. 2—Complete Delco system used on the Model "J" Hudson cars

CONNECTING UP MEA AND SPLITDORF APPARATUS

Q—Advise us how to connect batteries to a Mea high tension magneto to help in starting. We have a Jefferson Yale lock universal switch and a Sumpter starting coil to use in connection with the Mea. We wish to install this on a 1909 Cadillac.—Snow's Garage, Spirit Lake, Ia.

See Figs. 3 and 4. The Sumpter coil is many times confused with the Splitdorf A. V. S. 2 coil, the back of which is illustrated in Fig. 4. Although the internal arrangements are practically identical, the exterior connections differ slightly. As will be seen in Fig. 3, the Sumpter coil is simply a straight primary winding with a vibrator and condenser. The switch used should be of the double pole single break type, as illustrated.

With the switch lever on the battery side and the magneto breaker points open, the vibratory action of the Sumpter coil sets up a current in the magneto, primary and secondary windings which results in a shower of sparks at the proper plugs. With the switch in the central position, all circuits are open and the magneto functions as such. When the switch is in the lefthand or off position, the magneto is grounded and inactive.

With this installation two things must be given very careful consideration. The battery should be no larger than is absolutely necessary to supply a good spark, as in one of the magneto armature positions the magnetism generated is opposed to that of the permanent field magnets and will have a tendency to weaken them. Also the switch must be turned from the battery position as soon as the engine starts and must never be left on the battery position with the engine at rest. If the first caution is disregarded, the points will be very quickly burned out from sparking, while if the second is not given attention, the battery will be discharged, the coil damaged and it is quite likely that the field magnets will be completely neutralized.

WIRING DIAGRAM OF PAIGE 6-55 IGNITION COIL

Q—Publish sectional view and give full description of Remy coil used on Paige 1919, 6-55 model.—Richard L. Rumely, Chicago.

See Fig. 5. This is what is known as a three terminal coil, meaning that three primary low-tension terminals are used. The third one is needed in order to connect the distributer breaker points to the condenser, which is within the body of the coil. As will be noted from the illustration, the battery current comes first from the ignition switch to the resistance unit on top of the coil. After going through the coils of the resistance unit it then passes through the primary, low-tension course winding of the coil and out to the stationary distributer breaker point.

From the breaker lever the current is then led back to the center terminal of the coil from whence another wire returns it to the ignition switch. The remainder of the current path is through the mechanism of the switch, to ground

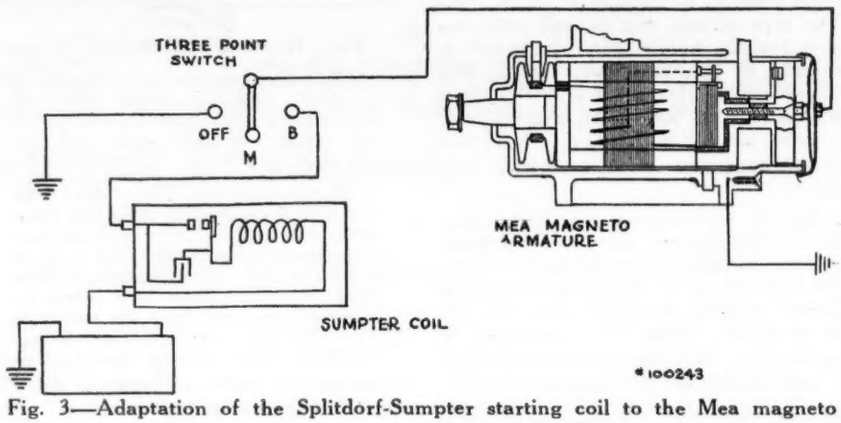


Fig. 3—Adaptation of the Splitdorf-Sumpter starting coil to the Mea magneto

Fig. 4—Terminals of the Splitdorf A.V.S.2 coil, often confused with the Sumpter coil.

and thus back to the battery. The path of the secondary current is even simpler, being from the heavy terminal on the side of the coil to the center terminal of the distributer block. From this point the distributer rotar distributes it to the proper points in the proper order. After traveling to the plugs and jumping the gaps it returns to the other end of the fine, high-tension secondary coil winding by way of the ground.

SPECIFICATIONS OF STARTERS AND GENERATORS ARE NOW AVAILABLE

Q—Where can we get a book showing specifications of all starting motors and generators used in starting and lighting systems on cars? We wish to know the charging rate of generators, the torque of starting motors and also their internal wiring arrangement.—Geo. D. McCabe, Lexington, Nebr.

Such a book has recently been placed on the market. On each page beside the wiring diagrams, of which there are over

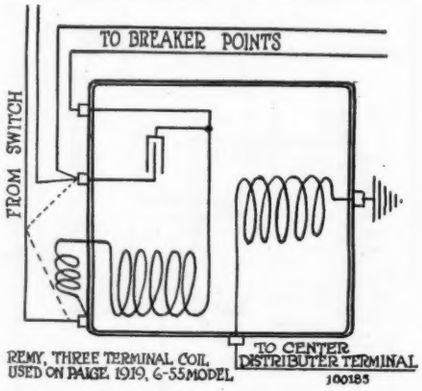

TO BREAKER POINTS
FROM SWITCH
REMY, THREE TERMINAL COIL, USED ON PAIGE 1919, 6-55 MODEL
TO CENTER DISTRIBUTER TERMINAL
100185

Fig. 5—Conventional diagram showing the circuits of three terminal coils. See also Fig. 1.

900, such information as the proper cutting-in and cutting-out speed of generators, their normal current output, the torque of starting motors and their normal current draw on test, the normal current consumption of ignition coils and lighting equipment is given. The book may be procured from the U. P. C. Book Co., 239 West 39th St., New York City.

VOLTAGE OF HIGH TENSION SPARK

Q—What is the voltage of the spark which passes across the spark plug gap? —Francis J. Joslin, Independence, Ia.

It depends upon several factors, chief among which is the general excellence of the ignition apparatus construction. It varies between 3,500 and 7,500, and may reach as high as 12,000 volts.

REWINDING A SIMMS HUFF MOTOR GENERATOR

Q—Can the windings of a Simms Huff motor generator used on Maxwell cars be changed so as to generate 12 volts instead of 6? If so, how can the greatest amperage be obtained?

2—Can a 6-volt starting motor be used in any way on the 240-volt D.C. line? The one I have in mind is an Auto-Lite M-1, used on an Overland 90 car.—J. B. Stansberry, McGaffey, N. M.

1—The Simms-Huff generator can be rewound to generate 12 volts. The work is done by the Simms Magneto Co., 277 N. Arlington Ave., East Orange, N. J., or by any of the official service stations of this company.

2—A 6-volt starting motor can be used for light service on a high voltage line by connecting it through a bank of lamps or a rheostat. The method has been illustrated several times in MOTOR AGE in the past. As this starting motor is a straight series wound machine, it will develop a destructive speed if allowed to run idle. It must always be held down by a load.

BOOKS ON RADIATOR REPAIRING

Q—Inform us where we can get some information, or a good book on automobile radiator repairing.—Frank Mooney, Lake Charles, La.

"Automobile Repairing Made Easy," by Captain Victor W .Page, and "The Automobile Repairman's Helper," by S. T. Williams. While neither of these books deals with automobile radiator repairing exclusively they both devote considerable space to the subject, and treat it in quite complete detail. They may be purchased from the U. P. C. Book Co., 239 W. 39th St., New York.

ENGINES

SPEEDING UP BUICK MODEL D-44 ENGINE

Q—In preparing to speed up a Buick Model D-44 engine we are going to have the block reground. Would you recommend aluminum pistons or cast? How are the Kant-Skore or the E. C. Long pistons? Will they stand up?

2—Could we obtain more speed by setting the camshaft ahead? If so, how many notches would be advisable?

3—What spark plug gap and breaker gap setting would be best?

4—Also, what valve clearance is advised?

5—We have been informed that a standard Ford piston is .010 in. smaller at the head than at the skirt. A certain textbook also states that the pistons should fit the bore so that a .004 in. blade of a feeler gage is tight and a .003 in. blade loose. Where do they mean, at the skirt or the head?

6—Do you think that it is important to use connecting rod alignment tools when overhauling an engine, or is it sufficient to see that the upper end of the rod does not strike the side of the piston boss?

7—We have the idea that reboring is very inferior to regrinding, but some claim that reboring will stand up longer than a regrinding job.

8—What is a good and simple method in fitting pistons to a rebored job? To a reground job?

9—Are micrometers as reliable as ordinary calipers for comparative measurement?

10—Is the HaLee crankpin tool an accurate device for truing up crankshafts?

11—Is there any danger of weakening a crankshaft in straightening it in a special press equipped with a dial gage?—R. M. Betty, Witt, Ill.

1—It is counter to our policy to recommend any particular apparatus, device or product. However, we have no doubt that perfectly satisfactory results will be obtained with either aluminum or lightweight iron pistons. We have had very satisfactory reports of both of the makes of pistons mentioned.

2—A slight increase in speed might be obtained by advancing the camshaft not more than one tooth.

3—Spark plug gap about .018. Breaker gap, regular.

4—We do not quite understand what you mean by valve clearance, whether you mean the actual, "in the clear," opening of the valves or the distance between the rocker arms and the valve stems. The former you can not change without altering the contour of the cams. The latter you can change but a trifle for the reason that any great variation will upset the full opening of the valves. We do not recommend a clearance of more than .003 to .004 in. in excess of that specified by the manufacturer.

5—The measurement should be made at the skirt.

6—By all means use the jigs. Springing a connecting rod just so that it does not hit the piston boss is not sufficient. It should be aligned perfectly with the piston.

7—We generally recommend regrinding, although reboring is reported to be very satisfactory when correctly done.

8—The recommendation of the best authorities is that the new pistons be lapped in an old cylinder—never in the newly-reground one. The same applies to a reground job.

9—The best results with either tool depend upon a highly developed sense of touch. On the whole, we are disposed to favor the micrometer.

10—We have heard very good reports of this tool.

11—No, not if the job is carefully done. The pressure should be applied gradually and steadily and never suddenly.

STRAIGHT EIGHT-POWER PLANT MADE WITH FORD ENGINE

Q—We are planning to build a racing car, using two Ford engines and connecting them one ahead of the other. Will you please tell us where we can get information regarding the same? We would like to get information concerning the method of connecting them, and concerning the driveshaft and the size of gears to use. We should like to get plans, if possible.

2—Would it be advisable to use the Ford chassis?—J. C. Duncan, Rock Springs, Wyo.

1—The building of a straight eight power plant by coupling two stock Ford engines together was accomplished in 1915 by the firm of Battle & Hubbard, of Dallas, Tex. The engines were coupled together by connecting the crankshaft by means of a flange coupling, using the original flange on the front engine shaft and shrinking another on the front end of the rear engine shaft and bolting the two together as shown in the illustration, Fig. 6. The crankcase was made by using the front and rear ends of a stock Ford crankcase and brazing in steel sections to give it the required length.

The intake manifolds were of the original Ford type, the rear one being sawed in two and turned around and the two welded together. The carbureter used was a model 2C Stromberg double jet type. Doubtless, one of a later model or possibly two, one to each group of cylinders, will give better results than the original installation.

The two exhaust lines ran back into a single muffler designed especially for this engine. Atwater-Kent ignition was used, regular Ford type, excepting the distributer head, which was built especially for this engine.

2—The Ford chassis should be satisfactory, if adequately reinforced. On the car in question the chassis was built up of units from two different makes of cars.

JEFFERY OIL DRAIN IS INTENTIONAL

Q—We have had the oil pan off to repair the engine on a Jeffery 1915, 4-cylinder model. The oil always has, and does yet, leak out at the rear, near the fly wheel. There is a collar in the crankcase which should shut off te oil, but fails to do so. The leak is too great to leave go without stopping.—Alfred Zehetner, Milwaukee, Wis.

We think it likely that the oil level is being maintained too high in this engine and recommend that less oil be used. The hole directly under the field windings of the starter is to protect them from becoming oil soaked. The hole must be left open.

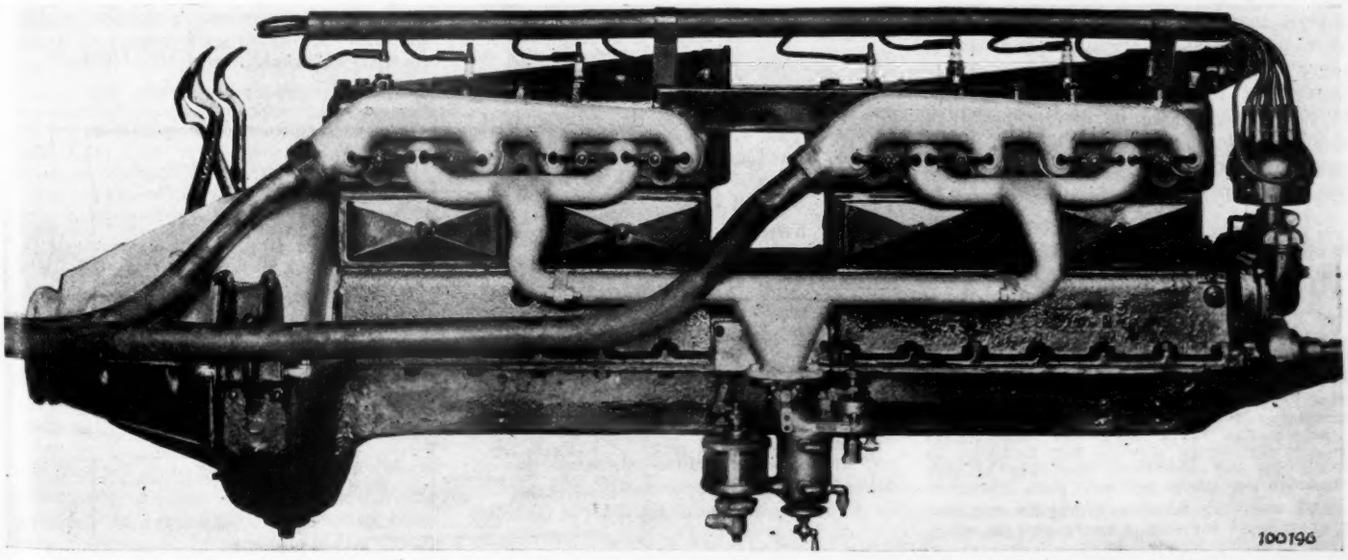


Fig. 6—How one ingenious reader made a straight eight-power plant with two Ford engines

Automotive Architecture

Planning & Building Problems

Conducted by Tom Wilder

Fireproof Building for Accessory Store

PLAN NO. 359

Q—We are about to add a small fireproof building constructed of brick and plate glass for gasoline, oil and greases with a small stock of tires, tubes and accessories. Larger supplies will be carried in the shop storeroom, to be taken from it as required.

Our present lot of ground is only about 20 by 20 ft., as the repairshop in the rear takes up the balance, which is 30 by 40 ft. We want two Visible and two oil pumps at the curb—or would you advise cabinet tanks for oil? The gasoline tanks are 1000 gallons.

Twenty to 40 cars and trucks per hour through the weekdays and 50 to 120 per hour Saturday evening and Sunday pass here; we would like an oil container large enough to maintain a good supply, as oil deliveries are made only once a week. Gasoline is delivered daily.

What size of building would you suggest?—Fred L. Noon, Johnstown, Pa.

This 20 ft. by 20 ft. space in front of your repairshop will make a very nice sized accessory store. It might be a little smaller but you could not gain in any other department by making it smaller, so we would advise using all of the space and installing liberal display windows.

If these windows are kept trimmed up in nice shape the appearance of your place will be improved and will take on more of a businesslike air than the repairshop could possibly give it.

As a rule, the frontage of 20 ft. is only enough for one pump, but there is probably very little traffic in and out of the shop so that no harm would be done by gas customers obstructing the shop entrance.

The oil pumps with underground tanks would be by far the best arrangement but would be rather expensive to install if your customers demand several grades of oil. If you could arrange a convenient elevated supply with pipes leading to faucets at the curb you would have a very inexpensive proposition which would be very efficient; the only labor required would be in elevating the oil to the containers.

Garage and Filling Station on Main Highway

PLAN NO. 360

Q—We expect to construct a garage and filling station and would be pleased to receive your assistance and advice. We are located right outside the city limits and on the main highway. We would rather not build a very big building at first; we can build on the rear at any time, as the lot is large.

We want an accessory display window, a storeroom for repair parts and an office. There are to be two men employed in the repairshop. We would like to have space for about eight cars on the main floor and, if room permits, for one car on the sales floor, in front. We would also like to have a driveway between the garage and the house and also a little space between the driveway and garage to plant shrubbery. The O mark is an electric light pole and X mark is a tree. Is there a way of getting around that tree and pole? As the tree is very beautiful, I don't like to cut it down. Space will also have to be allowed for the sidewalk. I prefer a one-story building.—Kurt Stechmessen, Manitowoc, Wis.

You say you don't want to build a very large place but you do not mention how large, so we are at a loss to know just how far to go.

We do not think it practical to build a driveway with a shrubbery border since if you do this it will be at the expense of efficiency in the building. You really should discard the driveway and make the building full 50 ft. wide. The driveway is of little use, and with the entrance into the garage and shop as we show it back of the accessory store, the driveway will only make another outside entrance necessary, and outside entrances are space fillers at best.

There is no reason why your tree should be disturbed unless it obstructs the sidewalk too much and even then you could set the building back farther if the tree seemed more valuable than the space. We have allowed 10 ft. between the curb and building. Perhaps you will think that not enough.

Unless there is some serious objections that we do not know of, a curb pump would be just as serviceable as a drive-in filling station and be much less of a waste of space. Unless the road is narrow and terribly crowded, the curb pump is just as good. We have had an instance called to our attention where 1,750,000 gallons of gas were sold from one 5-gallon curb pump.

AUTOMOTIVE ARCHITECTURE

IN this department MOTOR AGE aims to assist its readers in their problems of planning, building and equipping service stations, garages, dealers' establishments, shops, filling stations, and in fact any buildings necessary to automotive activity.

When making requests for assistance please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

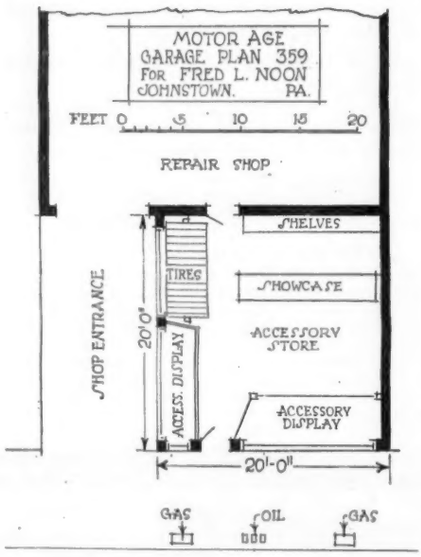
What departments are to be operated and how large it is expected they will be.

Number of cars on sales floor.

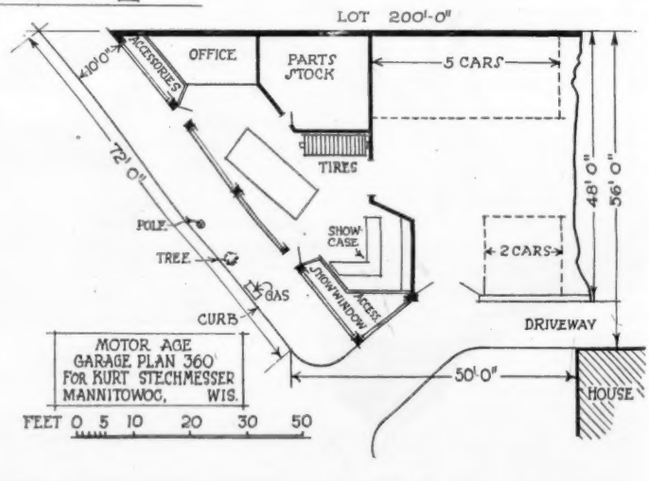
Number of cars it is expected to garage.

Number of men employed in repairshop.

And how much of an accessory department is anticipated.



Plan 359—Fireproof building suitable for a repairshop and accessory store Plan 360—Suitable for a garage and filling station on the main highway



Legal Problems

Conducted by Wellington Gustin

Fulfilling Contract to "Put Car in Good Running Order"

Q—A customer brought his car into my garage for overhauling and repairs. After looking over the car I made a price for putting it in good running order. When I had repaired the car I took it to the customer's place of business for delivery, but the customer refused to accept it until his mechanic had examined it and "O. K.'ed" the job.

I brought the car back to the garage and have refused to permit removal of the car for a test by the mechanic, but have permitted tests in the garage. I am holding the car under my lien rights, and am claiming storage charges, as well as repair charges. The car is old and I have it in fair condition, but it would take twice the contract price to put it in good running order.

Have I the legal right to hold this car? May I charge for storage while holding? Is the customer entitled to have his own mechanic examine this car before acceptance of my work and before payment?

You must perform your part of the contract fully before you can require an acceptance of your work. The customer would be entitled to have his mechanic make any reasonable examination of the car to see if it had been put "in good running order," according to your agreement. That it is in "fair condition" does not comply with your agreement, unless you can show that the work and repairs were done as agreed, and that your meaning of "fair condition" is synonymous with "good running order."

If there is a real complaint on the part of your customer as to your work then you could not charge for storage. You have no right to hold the car under your repairman's lien for your charges.

Protection Assured by Contract Agreement

Q—I am thinking of putting a car in the taxi service and have a man to drive it, or, rather, I am to furnish the car and this man is to pay me a certain amount for each mile driven.

Should there be an accident or collision, who is responsible, the driver or I? How should I protect myself?—Ed. B. Jackson Garage, Farber, Mo.

You should protect yourself by contract agreement with the party. If you so desire, you could arrive at some just arrangement between yourselves as to who shall stand the loss if there is any.

But suppose your party is irresponsible financially? Then you both might want protection. Why not agree upon an insurance policy to cover and protect both?

Without any agreement or policy the question of responsibility becomes complex. However, in general, if the driver is negligent he would be responsible primarily to you as well as to third parties. If he is an agent or servant of yours in driving your car, then you would also be liable for any injuries suffered by others through his negligence. Without the relation of master and servant, employer and employee or agency, the driver would alone be responsible for his negligent acts. If this should constitute a partnership arrangement then you would be liable as a partner.

Legal Service

SEEMINGLY knotty legal problems are constantly arising in the dealer's business, which even a slight knowledge of the law easily may solve. MOTOR AGE presents here the most common legal problems which confront the dealer. Mr. Gustin, a member of the Chicago bar, not only is well versed in the law relating to the dealer, but presents it in such a way as to be readily understood by the layman. In addition to his articles, Mr. Gustin will gladly answer such individual inquiries on knotty points as may be submitted to him.

Must Prove Counter Claim to Retain Deposit

Q—We have been dealers for the ——— car. When we took the agency we deposited $500 with the company under the contract. Since then the agency contract has terminated, and we have paid in full for all automobiles ordered out, and have paid all other accounts due the company. But the company refuses to return the deposit, claiming that at the time the deposit was made we gave an order for 10 cars, with a deposit of $50 on each, the total making the $500 deposit. We sold but one car and contend that we were not compelled to take the nine other cars.

Your contract should determine this. If you actually ordered 10 cars, depositing $50 each, then failed to take them out, the company would have a right to hold the deposit. However, if you have stated the case correctly you are entitled to your $500. One case holds that the burden of proof in such cases, where the contract has expired, rests upon the company to allege and prove some valid defense or counter claim entitling it to retain the deposit.

Lien on Car Sold to Another

Q—I furnished supplies for B's automobile, but the supplies were sent to B on his order and the car was never in my possession. Am I entitled to a lien on the automobile under the New Jersey laws, though it was never brought to my shop and was not in my possession at the time supplies were furnished?

2—This car has been sold to X who claims to be an innocent purchaser of the car and says he had no knowledge of my claim on the car at the time he bought it. Have I any claim against this car now in the hands of X?

Yes. Under the New Jersey statute giving garage keepers a lien on an automobile for which supplies are furnished, you have a garage keeper's lien on the car, although it was never in your possession.

2—You have a good claim and may seize the car and enforce your claim of lien, although it is now in the possession of an innocent purchaser for value who did not know of your lien.

Rights of Seller in Rescinding Contract

Q—We entered into a contract for the purchase of a garage, paying $1,000 down. The garage owner has notified us that he is unable to secure a transfer to us of his lease on the property, as the landlord is not willing to permit the assignment of the lease. He has returned the $1,000 and has demanded the return to him of an automobile which we obtained under the contract, claiming he has the right to rescind the contract because his landlord will not permit of his making the assignment of the lease. Can we hold the garagekeeper to his agreement and force him to get this lease assignment? Or does he have a right to rescind this contract?

The rule is that upon failure of the seller to perform a material part of his contract the buyer may elect to treat the contract at an end, perhaps rescind the contract; still, the seller, upon learning of his inability to perform a material part of the contract, may not rescind it and relieve himself from its terms, or relieve himself of an action for damages for its breach.

In this case he contracted to deliver to you the property sold, and his inability to comply with his contract does not relieve him from its obligations. Of course, you can not enforce a specific performance of your purchase because the garageman is not in a position to deliver. He cannot force the landlord to agree to the assignment of the lease. Your remedy is an action for breach of contract, and you may hold the automobile you obtained under the contract until a settlement is had.

The Accessory Show Case

New Fitments for the Car

NEW LEA VISCO-METER REGISTERS DILUTION OF CRANKCASE OIL

This device is installed on the dash or under the hood. From a small opening inside the gage the crankcase oil can be seen flowing slowly across the face of the dial. As the heat and gasoline lower the viscosity of the oil, thinning it out, the oil flows faster. When it passes a mark on the temperature gage this indicates to the driver that the oil has become so diluted or thinned that it has lost its lubricating properties. There are no working parts in this device. Price $15.—William Akers, Jr., Co., Tenth and Filbert street, Philadelphia.

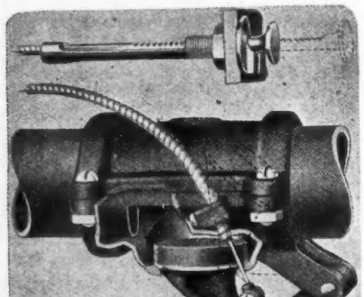
Lea visco-meter registers viscosity of crankcase oil

AUTOMATIC WINDSHIELD CLEANER

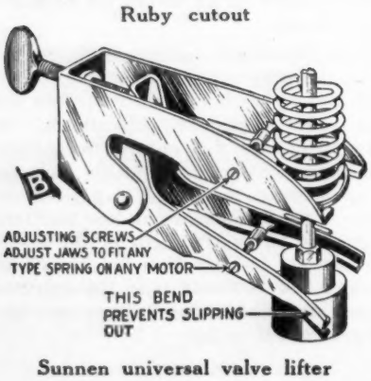
The operating mechanism of this cleaner attaches to the top of the windshield and receives its power impulses through a tube connected to the intake manifold or the vacuum tank. When a button is turned, the cleaner automatically starts to swing back and forth across the glass. It is made in one type to fit all cars, open and closed. Price complete, $10. Mayo-Skinner Mfg. Co., 2115 Elston Ave., Chicago.

SUNNEN UNIVERSAL VALVE LIFTER

This valve lifter, it is claimed, can be adjusted to fit any engine. The upper jaws are adjustable to the valve spring seat and the lower jaws rest on the push rod, the push rod guide or, in cases where the guide comes too close to the spring, can be expanded to go over the guide and rest on the block. This allows room for removal of the spring. The lifter can be swung around in any position and will not slip out.—Banner Accessory Mfg. Co., 2629 La Salle st., St. Louis, Mo.



Ruby cutout

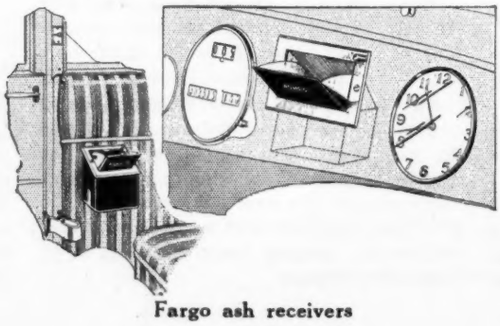


Sunnen universal valve lifter

Clamert chain couplers

NEW RUBY CUTOUT HAS WIRE CONTROL

This cutout is operated by a handle on the dash attached to a wire control running to the cutout. No spring is used, as the valve closes and locks with one push of the operating handle. Four bolts clamp this cutout to the exhaust over a rectangular sawed slot. The Ruby prices run from $5.50 for the 1½ in. size to $8.50 for the 3 in. model. Ruby Mfg. Co., Springfield, O.



Fargo ash receivers

CLAMERT CHAIN COUPLERS FOR BROKEN CHAINS

These are locking chain links for joining the separated sections of non-skid chains. To attach, make the slots in both tumblers register at the gap in the coupler. Place the broken chain in the long end of the coupler first; register tumblers again, and place the other end of the broken chain in the short side of the coupler; turn the tumblers to lock. Packed in tin counter display box for dealers. Price, three for 25c.—The Clamert Mfg. Co., Pittsburgh.

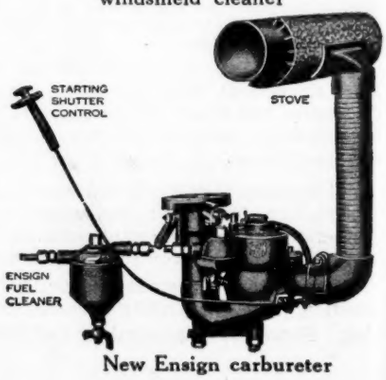
FARGO ASH RECEPTACLE

This ash or burnt match receptacle is made in various models to be attached to side walls or on a sloping dashboard. A touch on the button makes the lid fly open. The lid is closed when not in use. The base is removable for the emptying of the contents. Finished in black with nickle trimmings. Price, $3.—The Fargo Co., Ripon, Wis.

NEW MODEL ENSIGN CARBURETER

The new model E Ensign carbureter has manual starting control and an idling adjustment. The adjustments are placed on top of the carbureter, where they are more accessible. The closing of the starter shutter or choke creates a speed revolution in the mixing chamber in direct ratio to the amount the shutter is closed, even at low engine speeds.—Ensign Carbureter Co., 217 E. 17th st., Los Angeles, Calif.

Mayo-Skinner automatic windshield cleaner



New Ensign carbureter

Service Equipment
Time Savers for the Shop

CAMPBELL BEARING PULLERS AND OUTER RACE EXTRACTORS

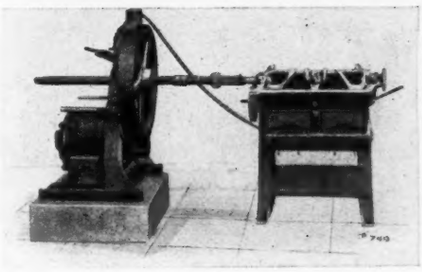
This line consists of extractors for removing outer races, and bearing pullers for removing the inner cones of bearings used on magneto armature shafts and other electrical equipment using this type of bearing. These tools are adjustable to different sized bearings without the use of tools. The bearing puller is made in two sizes. The annular puller has a positive clamping device which prevents it from slipping off the bearing. The jaws are small enough to use it on types of bearings having the windings projecting out over the bearings. Campbell Auto Works, 238 El Dorado St., Stockton, Calif.

"ECO" BURNING-IN AND RUNNING-IN EQUIPMENT

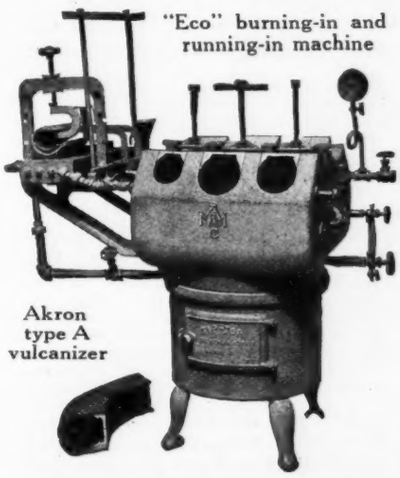
This equipment is used for burning-in and running-in Ford engines and all other makes of engines, provided a bench or stand capable of holding the engine block is available. It is portable and can be used to crank stiff motors. The line shaft is fitted with a universal joint. A 3-phase A. C. motor is used, back-geared nine to one ratio, giving 27-hp. torque on line shaft, less the friction. Price complete, as shown, $300. Western Mfg. Co., Oskaloosa, Ia.

DUBY IDEAL WHEEL GAGE

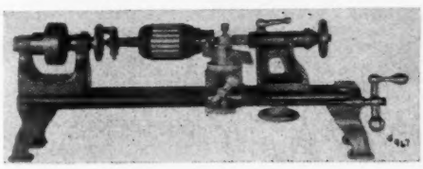
This wheel alignment tester operates by compressing the spring and placing the ends of the gage against the inside of the tires or the wheels at a height allowing the ends of both chains to touch the floor lightly. After the reading is taken in this position, the car is moved forward until the ends of the chains again graze the floor back of the wheels where the reading is taken. Price, $10. John F. Duby, 11 River St., Mattapan, Mass.



"Eco" burning-in and running-in machine



Akron type A vulcanizer



Commutator truing lathe

NEW BATTERY ACID PUMP

This pump is designed to fit the majority of the carboys on the market. It has an automatic air control by which the flow of the pump may be stopped instantly. This device is adjustable to any carboy up to three feet in depth. The outlet consists of hard rubber tubing standing a specific gravity acid up to 720. Price, $3.75. Leader Battery Equipment Co., Title Guaranty Bldg., St. Louis.

PIONEER GARAGE SPECIAL DRILL AND VALVE GRINDER

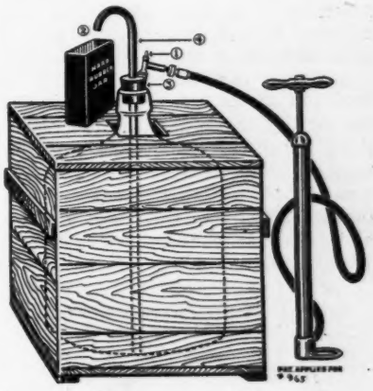
This is a combined drill and valve grinder especially designed for garage and service station use. It is equipped with oscillating spindle for grinding valves. It operates on either direct or alternating current; voltage, 110 or 120; weight, 8 lb.; length over all, 13 in.; offset of spindle from side of frame, 1⅛ in. Louisville Electric Mfg. Co., Louisville, Ky.

COMMUTATOR TRUING LATHE

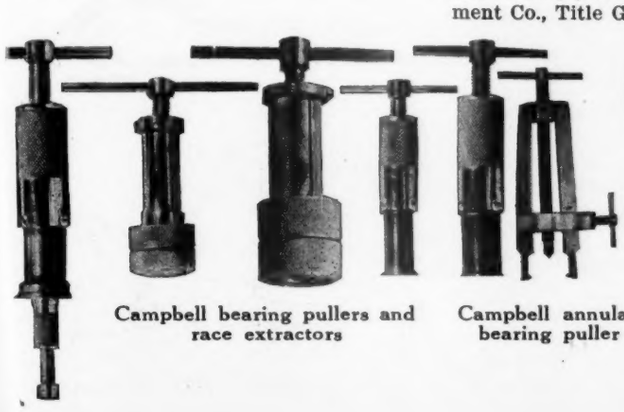
This commutator truing lathe was designed for the electrical service station to expedite such work as truing Ford timers, commutators, turning contracts, drilling and the many other little jobs in the hands of the electrical repairman. The swing of this lathe is 7 in.; weight, boxed for shipment, 55 lbs.; price, complete, $60. Central Mfg. Co., Fairfield, Ia.

AKRON LINE OF VULCANIZER EQUIPMENT

The new improved type A illustrated here has been designed to accommodate cord tires as well as fabrics. This is a three cavity outfit with self-contained steam boiler, tube plate and inside patch vulcanizer attachment. Another model made by this company is the type E cavity retreading vulcanizer. This is a self-contained outfit and will handle tires from three to five inch, cord and fabric. Akron Rubber Mold & Machine Co., Akron, O.

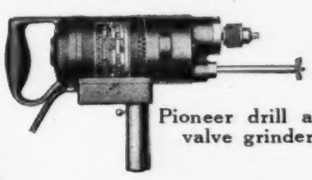


Leader battery acid pump

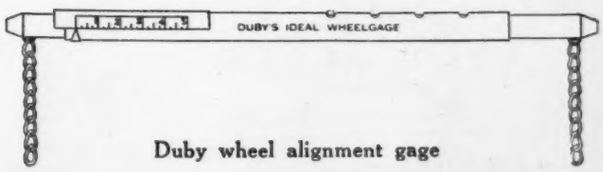


Campbell bearing pullers and race extractors

Campbell annular bearing puller



Pioneer drill and valve grinder



Duby wheel alignment gage

Automotive Repair Shop
Practical Maintenance Hints

Shallow Cuts in Piston Ring Stops Oil Pumping

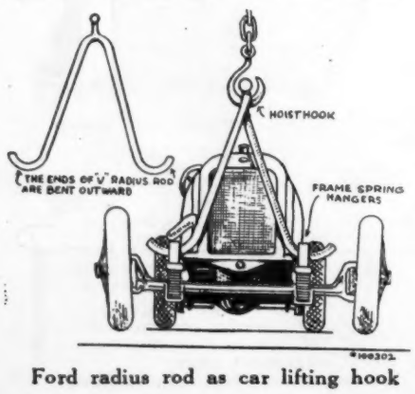
The method of fitting rings herewith illustrated has been found very successful. It is as follows: lay the piston ring on a flat surface and with a fine three-cornered file cut five or six fine grooves across the edge. These cuts should not be more than .003 in. deep. In placing the ring on the piston be sure and put the groove edge down. This method will usually stop oil pumping and does not always involve the use of new rings to stop the trouble.

This treatment should be applied to all three rings. If there is a chance for a little compression to leak past the bottom ring seat it will tend to blow the oil down on the cylinder walls faster than the suction will bring it up. In other words, the top of the ring should have a better seat than the bottom in order to check the oil on the suction stroke and allow it to pass down on the explosion and compression strokes. The slight loss in compression is nothing compared with the loss of power from foul spark plugs. This method has been tried out thoroughly under the worst conditions in the heart of the Rocky Mountains and has proved to be an effective and cheap method of stopping oil pumping.

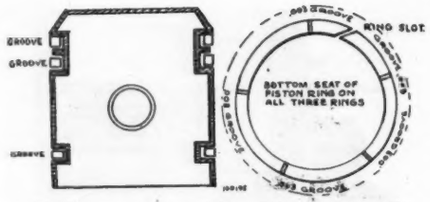
Repair of Demountable Rim Lug Bolts

When the wedge bolts for demountable rims on automobiles pull down into the felloe of the wheel, the wedges cannot be drawn tight. This is a common condition after the rims have been used for a year, during which time the wedge bolts have been frequently tightened up.

A simple and effective repair may be made on these wedge bolts by substituting for the lug bolts with the small heads Ford spring hangers, which have large heads and extensions for the adjacent screws. These will not pull down into the wood felloe as do the usual bolts, and in consequence, loose rims due to wedges or lugs being loose is overcome.



Ford radius rod as car lifting hook

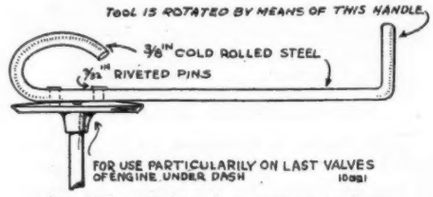


Shallow cuts in piston ring stops oil pumping

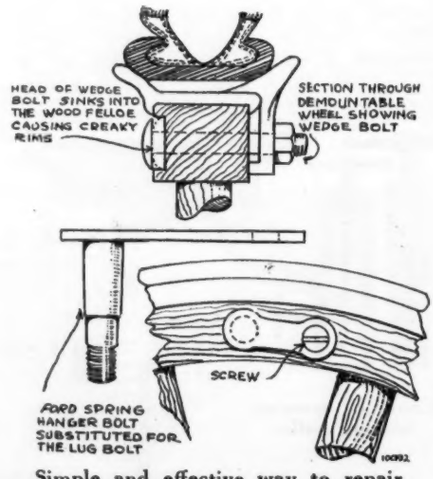
Simply add a wood screw in the other bolt hole of the spring hanger when placed on the wheel felloe. The spring hanger used can be an old one which is worn beyond further usefulness, and makes a more satisfactory bolt for the wheel than the original one.

Cooperation

COOPERATION is the keynote of the automotive industry this year and will become more important as time goes on. Motor Age is pleased to extend an invitation to its readers, wherever they may be, to contribute short articles and sketches on easy or improved ways of doing hard things, which they may have worked out and thus lend their aid in HELPING THE OTHER FELLOW. Correspondence among contributors is also strongly urged. Let's get together and make this a happy family with one end in view, that of hearty, unselfish COOPERATION.


TOOL IS ROTATED BY MEANS OF THIS HANDLE
3/8" COLD ROLLED STEEL
7/32" RIVETED PINS
FOR USE PARTICULARLY ON LAST VALVES OF ENGINE UNDER DASH

Special grinder for engine valves


HEAD OF WEDGE BOLT SINKS INTO THE WOOD FELLOE CAUSING CREAKY RIMS
SECTION THROUGH DEMOUNTABLE WHEEL SHOWING WEDGE BOLT
FORD SPRING HANGER BOLT SUBSTITUTED FOR THE LUG BOLT
SCREW

Simple and effective way to repair demountable rim lug bolts

Nut on Fender Bracket Eliminates Shake

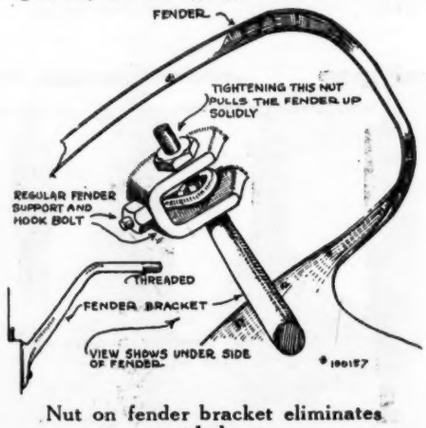
Ford fenders and other similar fenders are tightened down solidly by threading the end of the rod forming the bracket and placing on this thread a nut, as is shown in the accompanying illustration. After the fender is put on the bracket and the hook bolt is inserted with which the fenders are held, a nut is placed over the thread on the rod bracket and pulled up solidly, forcing the fender against the side of the car or into a secure position on the rod. This modification does not interfere with the removal or replacement of fenders, but simply clamps them solidly.

Special Grinder for All Engine Valves

The last two valves in an automobile engine are invariably neglected in the process of valve grinding because they are located unhandily under the dash. To reach these valves and to insure successful results, the grinder shown in the attached sketch is useful, as it is sufficiently long to reach into this comparatively inaccessible place. The tool consists of a piece of ⅜-in. cold rolled steel with two pins riveted in one end. The rod is bent to fit the palm of the hand, while the opposite end forms a handle for rotating the tool.

Ford Radius Rod As Car Lifting Hook

A hook for the hoist or overhead pulley, used as a means of raising one end of a car, can be improvised from a Ford radius rod, as is shown in the attached drawing. The ends of the rod, which are the connections for the front axle, are bent outward. When these are slipped under the spring hangers at either the front or rear, the hoist connection is made at the ball end of the rod. This lifter is strong, quickly applied, and as serviceable as one made especially for this purpose.


FENDER
TIGHTENING THIS NUT PULLS THE FENDER UP SOLIDLY
REGULAR FENDER SUPPORT AND HOOK BOLT
THREADED
FENDER BRACKET
VIEW SHOWS UNDER SIDE OF FENDER

Nut on fender bracket eliminates shake

Make of Tires—Type of Rims Used on 1921 Passenger Cars

Motor Age Maintenance Data Sheet No. 167

One of a series of weekly pages of information valuable to service men and dealers—save this page

Car and Model	Make of Tire	Size of Tire	Type and Make of Rim
Locomobile, all models	Goodyear	35 x 5	S. S. Firestone
Lorraine, 21-T		32 x 4	S. S. Firestone
Maibohm, B		32 x 4	S. S. Stanweld
Marmon—			
34, touring	Goodyear or Goodrich	32 x 4½	S. S. Stanweld and Goodrich
34, closed	Goodyear or Goodrich	33 x 5	S. S. Stanweld and Goodrich
Maxwell, 25	Goodrich or U. S.	30 x 3½	C. Kelsey and Stanweld
McFarlan, 1921		33 x 5	S. S. Firestone
Mercer, V—			
Touring		32 x 4½	S. S. Firestone
Sportabout		32 x 4½	S. S. Goodyear
Runabout		32 x 4½	S. S. Goodyear
Raceabout		32 x 4½	S. S. Goodyear
Limousine		33 x 5	S. S. Firestone
Merit	Goodrich or Firestone	32 x 4	S. S. Firestone
Meteor, R and RR	Choice of several makes	32 x 4½	S. S. Cleveland
Metz, 1921	Goodrich	32 x 4	S. S. Firestone
Mitchell, F-40		33 x 4	S. S. Stanweld
Monitor, all models		33 x 4	S. S. Stanweld
Monroe—			
Touring and roadster	Goodyear	32 x 3½	S. S. Firestone
Sedan and coupe	Goodyear	33 x 4	S. S. Firestone
Moon, 6-48	Miller	32 x 4	S. S. Firestone
Nash—			
681-6	Firestone or Goodyear	33 x 4	S. S. Firestone
687	Firestone or Goodyear	33 x 4	S. S. Hayes
682-4-5	Firestone or Goodyear	34 x 4½	S. S. Firestone
National Sextet, B. B.	Optional	32 x 4½	Q. D. S. S. Firestone
Nelson, D		31 x 4	C. Stanweld
Noma, 1C	Goodyear	32 x 4½	S. S. Goodyear
Norwalk, 430-KS		32 x 4½	S. S. Firestone
Oakland, 34-C	Goodyear	32 x 4	S. S. Jaxon
Ogren, 6-60		33 x 5	S. S. Firestone
Oldsmobile—			
43-A	Goodyear	32 x 4	S. S. Jaxon
46	Goodyear	33 x 4½	S. S. Jaxon
Overland—			
Touring and roadster	Fisk and Federal	30 x 3½	S. S. Stanweld
Sedan and coupe	Fisk and Federal	31 x 4	S. S. Budd wire wheels
Packard—			
Single Six	Goodrich and Firestone	33 x 4½	S. S. Kelsey
Twin Six	Goodrich and Firestone	35 x 5	S. S. Firestone
Paige—			
6-42	Firestone and Goodyear	32 x 4	S. S. Kelsey
6-66	Firestone and Goodyear	33 x 4½	S. S. Kelsey
Pan, A		33 x 4	S. S. Firestone
Pan American, all models	Firestone	33 x 4	S. S. Firestone
Parenti, 1921		32 x 4	S. S. Jaxon
Paterson, 6-50	Goodyear and Goodrich	33 x 4	S. S. Firestone
Peerless, all models	Firestone	34 x 4½	S. S. Firestone
Piedmont—			
4-30	Goodyear or Firestone	32 x 3½	S. S. Firestone
6-40	Goodyear or Firestone	32 x 4	S. S. Firestone

Continued next week

Abbreviations: "C." clincher, "S. S." straight side, "Q. D. C." quick detachable clincher, "Dmtbl." demountable.

Specifications of Current Passenger Car Models

NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Ace.....G	Guy..	6-3¼x5	123	32x4	$2975	$2975	....	$3680	$3680
Ace.....H	H-S..	6-3⅝x5	123	32x4	2975	2975	....	3680	3680
Ace.....L	H-S..	4-3¼x5	116	32x4	2260	2260	....	....	....
Allen.....Series 43	Own..	4-3½x5	110	32x4	‡1385	1385	....	....	2195
Ambassador.....R	Cont..	6-3⅜x5¼	136	33x5	....	†4500	$4500	....	6500
American.....C	H-S..	6-3¼x5	127	32x4	2195	2195	†2350	....	3150
Anderson.....Series 40	Cont..	6-3¼x4½	120	32x4	2195	1795	1845	2795	2795
Apperson. 8-21-S	Own..	8-3¼x5	130	34x4½	....	3000	3250	4500	4500
Apperson...Anniversary	Own..	8-3¼x5	130	34x4½	....	3500	3750	....	....
Auburn.....6-51	Cont..	6-3¼x4½	121	32x4	167	1695	1760	2475	2495
Beggs.....20T	Cont..	6-3¼x4½	120	33x4	1775	1775	....	2675	2775
Bell.....4-32	H-S..	4-3½x5	114	31x4	....	1495	....	....	....
Bell.....6-50	H-S..	6-3¼x5	124	32x4	....	1695	....	....	....
Biddle.....B1	Buda..	4-3¾x5⅛	121	32x4	3475	3475	....	....	3975
Birch Super-Four	H-S..	4-3½x5	117	33x4	1195	1195	†1245	2295	1795
Birch Light Four	Lek..	4-3⅜x4½	108	30x3½	1045	1045	....	....	....
Birch Light Six	H-S..	6-3¼x5	117	33x4	1395	1395	†1445	....	1995
Bour-Davis.....21S	Cont..	6-3½x5¼	126	33x4½	†2385	†2385	2385	....	....
Brewster.....91	Own..	4-4 x5½	125	32x4½	†7000	7000	....	....	10500
Briscoe.....4-34	Own..	4-3⅜x5	109	31x4	1085	1085	....	1685	1685
Brook.....S-21 A	Own..	2-3½x3⅝	90	28x3	395	....	....	....	....
Buick..1922-34-35-36-37	Own..	4-3⅜x4¾	109	31x4	935	975	....	1475	1650
Buick.....1922-44-5-6-7	Own..	6-3⅜x4½	118	33-4§	1495	1525	....	2135	2435
Buick.....1922-48-9-50	Own..	6-3⅜x4½	124	34x4½	....	....	1735	2325	2635
Bush.....E.C.4	Lyc...	4-3½x5	116	33x4	....	1195	....	....	....
Bush.....E.C.6	Rut...	6-3½x5	116	33x4	....	1345	....	1750	1850
Cadillac.....59	Own..	8-3½x5⅛	(125 (132	34x4½ 35x5	3790	†3790	 3940	....	4950 5190
Carroll.....C	Roch..	6-3½x5	128	32x4½	3185	3185	....	....	....
Case.....V	Cont..	6-3½x5¼	126	34x4½	....	†2250	2250	2900	3285
Chalmers.....6-30	Own..	6-3¼x4½	117	32x4	1495	1545	....	2295	2445
Chalmers.....6-30	Own..	6-3¼x4½	122	33x4½	....	....	1795	....	....
Champion.....Tourist	Lyc...	4-3½x5	113	32x3½	....	1095	....	....	....
Champion.....Special	H-S..	4-3½x5	118	32x4	†1395	1395	....	....	....
Chandler.....Six	Own..	6-3½x5	123	33x4	1785	†1785	1785	2785	2885
Chevrolet.....490	Own..	4-3¼x4	102	30x3½	525	525	....	875	875
Chevrolet.....FB	Own..	4-3¼x5¼	110	32x4	975	975	....	1575	1575
Cleveland.....40	Own..	6-3 x4½	112	32x4	1295	1295	....	2195	2295
Climber Four	H-S..	4-3½x5	115	33x4	1450	1385	....	....	....
Climber Six.....S	H-S..	6-3¼x5	125½	32x4½	2250	2250	....	....	....
Cole.....870	Nort..	8-3½x4½	127	33x5	2550	†2695	2795	3695	3995
Columbia Challenger	Rut..	6-3½x5	115	32x4	....	1195	....	†1995	1995
Columbia.....D-C&CS	Cont..	6-3¼x4½	115	32x4	1475	1475	†1475	†2295	2350
Comet.....C-53	Cont..	6-3½x5¼	125	33x4½	....	2350	2450	....	3650
Commonwealth.....44	H-S..	4-3½x5	117	32x4	....	1395	....	....	2465
Crawford.....21-6-40	Cont..	6-3½x5¼	122½	32x4	3000	3000	3000	....	4500
Crow-Elkhart....L63-65	Lyc...	4-3½x5	117	32x3½	‡1295	1295	....	....	....
Crow-Elkhart....S63-65	H-S..	6-3¼x5	117	33x4	‡1545	1545	....	....	2395
Daniels.....D-19	Own..	8-3½x5¼	132	34x4¼	‡5350	†5350	5350	6250	6950
Davis.....61-67	Cont..	6-3¼x4½	120	32x4	†1995	1895	†1995	2795	2795
Dispatch	Wisc..	4-3¾x5	120	34x4	1250	1350	1350	1525	1575
Dixie Flyer.....H-S-70	H-S..	4-3½x5	112	32x4	1445	1445	1945	2295	2345
Dodge Brothers	Own..	4-3⅞x4½	114	32x4	935	985	....	1585	1785
Doris.....6-80	Own..	6-4 x5	132	33x5	....	†4785	4785	5800	6690
Dort.....17-12	D-Ly.	4-3½x5	108	31x4	985	985	....	1535	1685
Driggs	Own..	4-2⅝x4½	104	30x3½	1275	1275	....	....	1975
Dupont.....A	Own..	4-3—x5⅛	124	32x4½	3400	†3400	....	....	4900
Durant.....A-22	Cont..	4-3⅞x4¼	109	31x4	....	890	....	1365	1365
Elcar.....K-4	Lyc...	4-3½x5	117	33x4	1195	1195	....	....	....
Elcar.....7-R	Cont..	6-3¼x4½	117	33x4	†1595	1595	‡1195	2395	2495
Elgin.....K-1	Falls..	6-3½x4¼	118	33x4	1595	1495	†1595	2395	2395
Essex	Own..	4-3⅜x5	108½	32x4	1375	1375	....	1880	2230
Fergus.....S-5-21	Own..	6-3¼x5	126	33x4½	....	Chassis Price		8500	....
Ferris.....C-20	Cont..	6-3½x5¼	130	32x4½	2695	*2595	....	....	3695
Ford.....T	Own..	4-3¾x4	100	30x3½	**325	††355	....	595	660
Franklin.....9-B	Own..	6-3¼x4	115	32x4	2300	2350	†2300	2850	3350
Gardner.....G	Lyc...	4-3½x5	112	32x3½	‡995	995	....	....	1795
Grant.....Six	Own..	6-3½x4½	116	32x4	1550	1550	....	2450	2450
H.C.S.	Weid..	4-3⅝x5½	120	32x4½	2725	†2775	....	3450	3650
Halladay, Manh. Special	Rut...	6-3½x5	118	33x4	....	1695	....	....	....
Halladay, Craft Special	Rut...	6-3½x5	123	33x4	....	2485	....	....	....
Handley-Knight	Kn'ht.	4-4½x4½	125	32x4½	....	....	2850	....	4185
Hanson Six.....60	Cont..	6-3¼x4½	121	32x4	1795	1795	1895	†2775	2885
Harroun.....A-A-2	Own..	4-3¼x5½	106	30x3½	....	1195	....	....	....
Hartfield.....A-42	H-S..	4-3½x5	115	32x4	†1495	1495	....	....	2395
Haynes.....75	Own..	6-3½x5⅝	132	34x4½	2685	†2485	2485	3185	3485
Haynes.....55	Own..	6-3½x5	121	3x4	1835	1765	....	....	2835
Haynes.....48	Own..	12-2¾x5	132	34x4½	4200	3635	3635	4650	4950
Holmes.....Series 4	Own..	6-3½x4¼	126	34x4½	†2950	....	2950	3850	4150
Hudson Super 6	Own..	6-3½x5	126	34x4½	†1895	....	1895	2770	2895
Hoffman.....R	Cont..	6-3¼x4½	120	32x4	1845	1795	....	....	2795
Hupmobile.....Series R	Own..	4-3¼x4..	112	32x4	1485	1485	....	2400	2485
Jackson.....638	Cont..	6-3¼x4½	121	32x4½	†2685	1950	....	3760	3760
Jordan.....M	Cont..	6-3¼x4½	120	32x4	2250	2250	....	3300	3300
Jordan.....F	Cont..	6-3½x5¼	127	32x4½	....	....	2475	....	3700
Kenworthy.....8-90	Own..	8-3 x5¼	130	32x4½	5000	5000	5250	6000	6000
Kessler.....K	Own..	4-3⅜x3¾	117	32x4	....	1995	....	....	2445
King.....J	Own..	8-3 x5	120	32x4½	2140	†2125	*2125	3125	3235
Kissel.....45	Own..	6-3⅞x5½	124	32x4½	2975	†2975	2475	†3775	*3775
Kline Kar.....6-55-K	Cont..	6-3¼x4½	121	33x4	2090	2090	2090	3250	3290
Kurtz Automobile.....A	H-S..	6-3¼x5	122	32x4	....	2050	....	....	3000
LaFayette.....134	Own..	8-3¼x5¼	132	33x5	4850	4850	4850	6250	6500
Leach	Own..	6-3¼x5¼	134	32x4	6500	6500	....	....	....
Lexington.....Series S	Cont..	6-3¼x4½	122	32x4	....	1885	....	2750	3150
Lexington.....Series T	Anst..	6-3¼x4½	128	32x4½	....	....	2785	....	3750
Liberty.....10-C	Own..	6-3½x5	117	32x4	1595	1595	†1675	2400	2495
Lincoln	Own..	8-3⅜x5	136	33x5	†4300	4300	4300	4950	5400
Locomobile	Own..	6-4½x5½	142	35x5	....	†8600	8600	....	....

NAME AND MODEL	Engine Make	Cylinders, Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Maibohm.....B	Falls..	6-3½x4¼	116	32x4	‡1575	$1575	†1575	$2395	$2395
Marmon.....34	Own..	6-3⅜x5⅛	136	32x4½	4185	†3985	3985	4875	5275
Maxwell.....25	Own..	4-3⅝x4½	109	30x3½	845	845	....	1445	1545
McFarlan.....1921	Own..	6-4½x6	140	33x5	6300	†6300	6300	7500	7500
Mercer.....Series 5	Own..	4-3¾x6¾	132	32x4½	3950	†3950	*3950	5150	5650
Merit	Cont..	6-3¾x4½	119	32x4	2245	†2245	....	....	....
Meteor.....R & RR	Dues..	4-4½x6	129	32x4½	5500	5500	....	....	....
Metz.....M6	Rut...	6-3½x5	120	32x4	1995	1995	....	2795	2895
Mitchell.....F-40	Own..	6-3¼x5	120	33x4	‡1490	1490	....	2590	2690
Mitchell.....F-42	Own..	6-3½x5	127	33x4	....	....	1795	....	....
Moller.....A	Own..	4-2⅞x4	100	27x3½	2000	....	....	....	....
Monroe.....S-9 & 10	Own..	4-3¼x4½	115	32x3½	1285	1295	....	....	....
Monroe.....S-11 & 12	Own..	4-3¼x4½	115	33x4	....	....	....	2075	2175
Moon.....6-48	Cont..	6-3¼x4½	122	32x4	1985	1985	2485	2985	2185
Moon.....6-68	Cont..	6-3½x5¼	125	32x4½	....	....	2485	....	3485
Murray-Mac Six	Own..	6-3½x5¼	128	34x4½	4250	4250	4250	....	....
Nash.....681-7	Own..	6-3¼x5	121	33x4	1525	1545	†1695	2395	2695
Nash.....682	Own..	6-3¼x5	127	34x4½	....	....	1695	....	....
Nash Four.....41-4	Own..	4-3¼x5	112	32x3½	1175	1195	....	1725	1935
National Sextet.....BB	Own..	6-3½x5¼	130	32x4½	2990	†1990	2990	3990	3990
Nelson.....D	Own..	4-3¼x4¾	104	32x4	....	1750	....	....	....
Noma.....1C	Cont..	6-3¼x4½	128	32x4½	2800	†2850	*3200	....	3700
Northway	Own..	6-3½x5¼	128	23x5	4200	*4200	6000	5000	5400
Norwalk.....430-KS	Lyc...	4-3½x5	116	32x3½	....	1035	....	....	....
Oakland.....34-C	Own..	6-2¾x4¾	115	32x4	1095	1195	†1295	1625	1725
Ogren.....6-60	Own..	6-3½x5¼	134	33x5	†3850	3750	3900	5000	5400
Oldsmobile.....43-A	Own..	4-3¾x5¼	115	32x4	†1145	1145	....	1645	1845
Oldsmobile.....37-A	Own..	6-2¾x4¾	112	32x4	†1450	1450	....	2145	2145
Oldsmobile.....46	Own..	8-2⅞x4¾	122	33x4½	....	††1725	1725	....	2625
Oldsmobile.....47	Own..	8-2⅞x4¾	115	32x4	....	††1625	....	2185	2425
Overland.....4	Own..	4-3⅜x4	100	30x3½	595	595	....	850	865
Packard.....Single-Six	Own..	6-3⅜x4½	116	33x4½	2975	2975	....	3650	3975
Packard.....Twin Six	Own..	12-3 x5	136	35x5	4850	*4850	4850	6600	6800
Paige.....6-42	Own..	6-3½x5	119	32x4	1635	1635	....	2450	2570
Paige.....6-66	Cont..	6-3⅝x5	131	33x4½	†2975	†3295	2875	3755	3830
Pan American.E&F-6-55	H-S..	6-3⅜x5	121	33x4	2000	2000	2100	....	....
Parenti.....1921	Own..	8-2¾x4¼	125	32x4	2000	2000	....	....	3000
Patterson.....650	Cont..	6-3⅜x4½	120	33x4	....	1595	1625	2895	2895
Peerless.....56-S-7	Own..	8-3⅜x5	125	34x4½	....	2880	2880	3500	3500
Peters	Own..	2-3½x3⅝	90	28x3	385	....	....	....	....
Piedmont.....4-30	Lyc...	4-3½x5	116	32x3½	....	970	....	....	....
Piedmont.....6-40	Cont..	6-3⅜x4½	122	32x4	....	1285	....	....	....
Pierce-Arrow	Own..	6-4 x5½	138	33x5	7000	†6500	6500	8000	8500
Pilot.....6-45	Teetor	6-3½x5	120	32x4	1945	1895	....	....	....
Pilot.....6-50	H-S..	6-3½x5	126	32x4½	2285	2285	2335	3350	3400
Porter.....6	Own..	4-4 ⅜x6¾	142	35x5	6750	Chassis Price		....	....
Premier.....6-D	Own..	6-3⅜x5½	126⅜	33x5	3790	†3690	3890	4690	5190
Premocar.....6-40 A	Falls..	6-3½x4¼	117	33x4	1295	1295	....	....	....
Raleigh.....A-6-60	H-S..	6-3¼x5	122	32x4½	2250	2250	....	3100	3200
R & V Knight.....R	Own..	4-3¾x5	116	32x4	....	2150	....	2850	2950
R & V Knight.....J	Own..	6-3½x4½	127	32x4½	3350	†3350	3350	4000	4200
Reo.....T-6	Own..	6-3—x5	120	33x4	1650	1650	....	2700	2750
Revere.....C	Dues..	4-4½x6	131	32x4½	4850	4650	†4650	....	6500
Rosmer.....6-54-E	Cont..	6-3½x5½	128	32x4½	2750	†2650	2750	†3850	3950
Roamer.....4-75-E	Dues..	4-4½x6	128	32x4½	3850	3650	....	....	....
Rolls-Royce	Own..	6-4½x4¾	143½	33x5	U. S.	Chassis Price		11750	....
Romer	Cont..	6-3¼x4½	120	33x4	2000	2000	2100	2450	2750
Saxton.....125	Own..	4-3½x5	112	32x4	1545	1495	....	2295	2295
Sayers Six.....DP	Cont..	6-3½x4½	118	33x4	§1945	1945	....	....	2995
Scripps-Booth...B-39-42	Nort..	6-2¾x4¾	115	32x4	‡1275	1295	....	1950	2100
Scripps-Booth...F-43-46	Cont..	6-3¼x4½	115	32x4	1470	1490	....	2350	2375
Seneca.....L & O	LeR..	4-3½x4½	108	30x3½	1045	1045	....	....	....
Severin.....Six	Cont..	6-3½x5½	122½	33x4½	1485	1485	....	2100	2250
Severin.....Six	Cont..	6-3½x5¼	122½	33x5	2550	2550	2550	3250	3350
Skelton.....35	Lyc...	4-3½x5	112	32x3½	995	995	....	....	....
Southern Six.....660-2	H-S..	6-3¼x5	127	32x4½	2375	2375	2395	....	....
Standard.....J	Own..	8-3¼x5	127	34x4½	3400	†3400	3400	4500	4600
Stanley Steamer	Own..	2-4 x5	130	34x4½	2800	2600	2600	3775	3850
Stanwood Six	Cont..	6-3¼x4½	118	33x4	2050	2050	....	2950	....
Stearns.....SKL4	Own..	4-3¾x5½	125	34x4½	2450	2450	2675	3400	3700
Stephens.....90	Own..	6-3¼x4½	122	33x4½	1900	†1985	2065	3100	3100
Stevens-Duryea.....E	Own..	6-4 ⅞x5½	138	35x5	7250	†6600	6800	9500	9000
Studebaker.....EJ-40	Own..	6-3½x4½	112	32x4	1300	1335	....	1695	1995
Studebaker.....EH-50	Own..	6-3½x5	119	32x4	1585	1635	†1635	2450	2550
Studebaker.....EG-60	Own..	6-3⅞x5	126	33x4½	....	....	1985	2850	2950
Stutz	Own..	4-4⅜x6	130	32x4½	3250	†3350	*3350	4800	....
Templar.....A-445	Own..	4-3⅜x5½	118	32x4	2385	2385	....	3185	3185
Texan.....A-38	Lyc...	4-3½x5	115	33x4	1195	1195	....	....	....
Texan.....C-12	H-S..	4-3½x5	115	33x4	1350	1350	....	....	....
Tulsa.....E-1-2-3	H-S..	4-3½x5	117	33x4	1285	1285	....	....	....
Tulsa.....F-1	H-S..	6-3¼x5	119	33x4	1585	1585	....	....	....
Velie.....48	Cont..	6-3¼x4½	115	32x4	1585	1585	†1800	2485	2485
Velie.....34	Falls..	6-3½x4½	112	32x3½	1385	1385	....	....	2085
Vogue.....6-55	H-S..	6-3½x5	124	32x4	....	1885	1960	2785	2885
Vogue.....6-66	Cont..	6-3½x5¼	124	33x4½	....	2085	2160	2885	2985
Washington	Falls..	6-3½x4¼	116	32x4	....	1785	....	....	....
Westcott.....C-48	Cont..	6-3½x5¼	125	32x4½	....	2090	2090	....	3490
Westcott.....C-38	Cont..	6-3¼x4½	118	33x4	1890	1890	†1990	2890	2890
Wharton.....A	Curt..	8-4 x5	136	34x4½	....	†1885	4885	....	....
Willis Sainte Claire.....	Own..	8-3¼x4	121	32x4½	2875	2875	....	3750	4100
Willys-Knight.....20	Own..	4-3⅝x4½	118	33x4	1475	1525	....	2195	2395
Winther.....61	H-S..	6-3¼x5	120	32x4½	....	....	2750	....	....
Winton.....25	Own..	6-3¾x5¼	132	35x5	4600	†4975	4600	5950	†5950

*—6-passenger. †—4-passenger. ‡—3-passenger. **—Price without starter and demountable rims. ††—Price without starter and demountable rims.

Engine Make: Anst.—Ansted. Cont—Continental. Curt—Curtiss. D.Ly—Dort Lycoming Dues.—Duesenberg. H-S—Herschell-Spillman. LeR—Leroy. Lyc—Lycoming. Nort.—Northway. Roch—Rochester. Rut—Rutenberg. Weid—Weidely. Wisc—Wisconsin.
§Model 47—34 x 4½ Tires.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Acason	¾	$1650§	3¾x5	34x5†	34x5†	W
Acason, R	1	2260	3¾x5¼	36x3½	36x5	W
Acason, RB	1½	2485	3¾x5¼	36x3½	36x6	W
Acason, H	2½	3295	4⅜x5¾	36x4*	36x8*	W
Acason, L	3½	4295	4⅜x5¾	36x5*	36x10*	W
Acason, M	5	5250	5 x6¼	36x6	40x12	W
Ace, C	1½	2295	3¾x5⅛	34x3½*	34x5*	W
Ace, A	2½	2795	4¼x5½	36x4*	36x7	W
Acme, G	¾	....	3¾x5	35x5†	35x5†	W
Acme, B	1	....	3¾x5	34x3½	34x5	W
Acme, F	1½	....	3¾x5	34x3½	34x5	W
Acme, A	2	....	4⅛x5¼	36x4	36x7	W
Acme, AC	2½	....	4½x5½	36x4	36x7*	W
Acme, C	3½	....	4½x5½	36x5	40x10	W
Acme, E	5	....	4¾x6	36x6	40x12	W
Akr'nMulti-Trk20	1	1995	4 x5¼	34x5	34x5	B
American, 25	2½	3350	4 x6	36x4*	36x4d*	W
American, 40	4	4275	4½x6	36x5*	36x5d*	W
Apex, G	1	1450††	3½x5	33x5†	33x5†	I
Apex, D	1½	1915	3¾x5⅛	34x3½	34x4	I
Apex, E	2½	2695	4¼x5½	36x4	36x7	I
Apex, F	3½	3975	4½x6	36x5	36x10	I
Armleder, 20	1	....	3¾x5¼	34x3½*	34x5*	W
Armleder, HW	2½	....	4¼x5½	36x4*	36x7*	W
Armleder, KW	3½	....	4½x6	36x5	36x5d	W
Atco, B	1½	....	3¾x5¼	34x5†	36x6†	W
Atco, B1	1½	....	3¾x5¼	34x5†	36x6†	I
Atco, A	2½	....	4¼x5½	36x4†	36x8†	W
Atlas, M.D	1	1550	3½x5	32x4½†	32x4½†	W
Atterbury, 20R	1½	2775	3¾x5	34x3½	34x5	W
Atterbury, 7CX	2½	3375	4⅛x5¼	36x4	36x4d	W
Atterbury, 7D	3½	4175	4½x5½	36x5	40x5d	W
Atterbury, 8E	5	5575	4¾x6	36x5	40x6d	W
Autocar, 21UF	1½-2	2300	4¾x4½	34x4*	34x5*	D
Autocar, 21UG	1½-2	2400	4¾x4½	34x4*	34x5*	D
Autocar, 26Y	....	4350	4¼x5½	34x6	36x12	D
Autocar, 26-B	....	4500	4¼x5½	34x6	36x12	D
Available, H1½	1½	2475	4 x5½	36x3½*	36x5*	W
Available, H2	2	2775	4 x5½	36x3½*	36x6*	W
Available, H2½	2½	3475	4 x5½	36x4*	36x8*	W
Available, H3½	3½	4475	4½x5½	36x5	40x5d	W
Available, H5	5	5375	4¾x6	36x6	40x12	W
Available, H7	7	6000	5 x6	36x6	40x14	B
Avery	1	....	3 x4	34x5†	34x5†	I
Beck, A. Jr.	1	1950	3¾x5	34x3½	34x4	I
Beck, C	2	2550	4½x5½	36x4	36x6	I
Bell, M	1	1650	3⅝x5½	35x5	35x5†	I
Bell, E	1½	2250	3¾x5¼	34x3½	34x5†	I
Bell, O	2½	2750	4¼x5½	34x4	34x6	I
Belmont, D	2	2675	3¾x5	34x3½*	34x6*	D
Belmont, F	3½	3525	4 x6	36x5*	36x5d*	D
Bessemer, G	1	1395	3½x5	35x5†	35x5†	I
Bessemer, H-2	1½	1995	3¾x5	36x3½	36x5	I
Bessemer, J-2	2½	2595	4⅛x5¼	36x4	36x4d	I
Bessemer, K-2	4	3495	4½x5½	36x5	36x10	I
Bethlehem, K	1	....	3½x5	34x4½†	35x5	I
Bethlehem, G	2	....	4 x5¼	34x3½*	34x6*	I
Bethlehem, H	3	....	4 x5¼*	36x4*	36x8	I
Bethlehem, J	4	....	4½x5½	36x5*	36x5d*	I
Bridgeport, A	1½	2350	3¾x5¼	34x3	34x6	W
Bridgeport, B	2½	2850	4¼x5½	36x4*	36x7*	W
Bridgeport, C	3½	3850	4½x6	36x5	36x5d	W
Brinton, F	2½	3400	4½x5¼	36x4	36x7	W
Brockway, E	¾	1675	3⅜x5⅞	35x5†	35x5†	B
Brockway, S-4	1½	2250	3¾x5	36x3½*	36x5*	W
Brockway, K-5	2½	3200	4⅛x5½	36x4	36x8	W
Brockway, R-4	3½	4100	4½x5½	36x5	36x5d	W
Brockway, T	5	4750	4¾x6	36x6	40x6d	W
Capitol, G1½	1½	2975	3¾x5	35x5	38x7	W
Capitol, H2½	2½	3700	4¼x6	36x4	36x8	W
Capitol, K2½	2½	4250	4¼x6	36x6	42x9	W
Capitol, M3½	3½	4425	4¼x6	36x5	36x10	W
Case, ††	2	3000	4¼x5¾	36x6	38x7	I
Champion Light Commercia	½	1195	3½x5	32x3½	32x3½	I
Chevrolet, G	¾	820	3⅛x4	31x4†	34x4½†	B
Chevrolet, T	1	1225	3⅛x5¼	33x4†	35x5†	W
Chicago, C1½	1½	....	3¾x5⅛	36x3½*	36x5*	W
Chicago, C2½	2½	....	4 x5⅛	36x4*	36x7*	W
Chicago, C3½	3½	....	4½x5½	36x5	36x10	W
Chicago, D5	5	....	4½x5½	36x6	40x12	W
Climber, A 20	1½	2450	3½x5	36x6*	38x7*	I
Clydesdale, 18	¾	1890	3¾x5	34x5	34x5	W
Clydesdale, 32C	1	2375	3¾x5⅛	34x3½*	34x5*	W
Clydesdale, 42C	1½	2475	4 x5⅛	36x3½	36x5	W
Clydesdale, 65C	2½	3250	4¼x5½	36x4	36x7	W
Clydesdale, 65EC	2½	3450	4½x5¼	36x4	36x7	W
Clydesdale, 90C	3½	4100	4½x5½	36x5	40x10	W
Clydesdale, 120C	5	4500	4¾x6	36x6	40x12	W
Collier, 18	1	2350	3¾x5	34x4	34x5	W
Collier, 19	1½	2550	3¾x5	36x4	36x6	W
Collier, 21	2	2950	4⅛x5¼	36x4	36x7	W
Collier, 22	2½	3250	4⅛x5¼	36x4	36x4	W
Columbia, H	1½	2350	3¾x5	35x5†	34x5	I
Columbia, G	2½	2850	4 x5¼	36x4	36x7	I
Comet	1½	1950	3¾x5	34x4	34x4	W
Commerce, T	¾-1¼	1450	3¾x5	34x4½†	34x4½†	B
Commerce, 12	1½	1800	3¾x5	35x5†	35x5†	I
Commerce, 16	2	2150	3¾x5	35x5†	35x6†	I
Concord, A	1½	3150	4 x5½	36x3½	36x6	W
Concord B	2½	3600	4¼x5½	36x4	36x8	W
Concord AX	1½	3250	4 x5½	36x3½	36x6	W
Concord, BX	2½	3600	4½x5½	36x4	36x8	W
Cook, 41	2	3000	4 x5½	36x6†	38x7†	I
Corbitt, H	¾-1	1800	3¾x5	35x5†	35x5†	B
Corbitt, E	1	2200	3¾x5	34x3½	34x4	W
Corbitt, D	1½	2600	3¾x5	36x3½	36x5	W
Corbitt, C	2	3150	4⅛x5¼	36x3½	36x7	W
Corbitt, B	2½	3300	4⅛x5¼	36x4	36x7	W
Corbitt, A	3½	$4100	4½x5½	36x5	36x10	W
Corbitt, AA	5	5000	4¾x6	36x6	40x6d	W
Cyclone A	1½	2685§	3½x5	34x5†	36x6†	I
Dart, S	1½	....	3¾x5½	34x3½	34x6	W
Dart, M	2½	....	4¼x5½	36x4	36x7	W
Dart, W	3½	....	4½x6	36x5	36x10	W
Day-Elder, A	1	2100	3¾x5	34x3½	34x4	W
Day-Elder, B	1½	2300	3¾x5	34x3½	34x5	W
Day-Elder, D	2	2750	4½x5¼	36x4	36x7	W
Day-Elder, C	2½	3025	4½x5½	36x4	36x7	W
Day-Elder, F	3½	3750	4½x5½	36x5	36x5d	W
Day-Elder, E	5	4250	4½x6	36x5*	40x6d*	W
Dearborn, E	1	1700	3⅝x5¼	35x5†	35x5†	W
Dearborn, FX	1½	2300	3¾x5⅛	34x4	34x5	W
Dearborn, F	1½	2180	3¾x5⅛	34x4*	34x5*	W
Dearborn, 48	2	2590	3¾x5⅛	35x5†	34x7†	W
Defiance, G	1	1695	3¾x5	35x5†	35x5†	I
Defiance, D	1½	2550	3¾x5	35x5†	36x6†	I
Defiance, E	2	2275	3¾x5	35x5†	38x7†	I
DeKalb, E2½	2	2600	4½x5¼	36x4*	36x6*	W
DeKalb, E2	2½	2250	4½x5¼	34x3½*	36x5*	W
DeMartini 1½	1½	2600	3¾x5	34x3½	34x6	W
DeMartini 2	2	3300	4 x5½	36x3½	36x7	W
DeMartini 3	3	4250	4½x5½	36x4	36x10	W
DeMartini 4	4	4800	4½x6	36x6	36x12	W
Denby, 31	¾	1625	3½x5	35x5	35x5	B
Denby, 33	1½	2300	3¾x5	35x5†	38x7†	I
Denby, 34	2	2600	3¾x5	36x3½	36x6	I
Denby, 25	3	3300	4½x5¼	36x4	36x7	I
Denby, 27	4	4200	4½x5½	36x5	36x5d	I
Denby, 210	5	4850	4½x5½	36x6	40x6d	I
Dependable, A	¾-1	1650	3⅝x5¼	34x5	36x6	W
Dependable, C	1½	2350	3¾x5¼	34x3½	34x5	W
Dependable, D	2	2650	4 x5½	34x5	36x6	W
Dependable, E	2½	2950	4¼x5½	36x4	36x7	W
Dependable, G	3½	3550	4½x6	36x6	38x7	W
Diamond-T, O	1	2500	3¾x5¼	34x5†	36x6†	W
Diamond-T, FS	1½	2960	3¾x5¼	36x3½	36x5	W
Diamond-T, T	1½	2650	3¾x5¼	36x3½	36x5	W
Diamond-T, U	2	3285	4 x5¼	36x4	36x7	W
Diamond-T, K	3½	4675	4¼x5½	36x5	36x5d	W
Diamond-T, EL	5	5400	4½x5½	36x6	40x6d	W
Diamond-T, S	5	5650	4¾x6	36x6	40x6d	W
Diehl, A	1	....	3½x5	34x4½	35x5	I
Diehl, B	1½	....	3½x5	36x6	36x6	I
Dispatch, F	1	1350	3¾x5	34x4†	34x4†	I
Doane	2½	4100††	4¼x5¾	36x5	36x7	C
Doane	3½	5100††	4½x5¾	36x5	36x5d	C
Doane	6	6000††	5 x6½	36x6	40x6d	C
Dodge Brothers	½	885	3⅞x4½	33x4†	33x4†	B
Dorris, K-4	2-2½	3400	4¼x5½	36x4	36x7	W
Dorris, K-7	3½	4400	4¼x5½	36x5	36x10	W
Double Drive B	3	4000	4¼x5½	6	6	W
Douglas G	1½	2050	3¾x5½	36x5	37x8*	W
Douglas I	3	3250	4¼x5½	36x6	37x8*	W
Duplex, A	1½	2775	4 x5¼	35x5†	38x7†	W
Duplex, E	3½	4250	4¼x5½	36x8	36x8	I
Duty, 21	3	1490	3½x5	34x3½	34x5	I
Eagle, 100-I	2	2275	3¾x5¼	34x4*	34x7*	I
Erie, E	1½	....	3¾x5¼	36x6†	36x6†	W
Erie, A	2½	....	4¼x5½	36x4	36x4d	W
F.W.D., B	3	4200	4¾x5½	36x6	36x6	B
Facto, 1921	2½	2895§	4¼x5½	36x4*	36x8*	W
Fageol, 1½	1½	3000	3¾x5¼	34x3½*	34x6*	W
Fageol, 2½	2½	3900	4¼x5¾	34x4	36x7	W
Fageol 3½	3½	5000	4½x6½	36x5*	40x5d*	W
Fageol, 5	5	5700	4½x6½	36x6	40x6d	W
Famous, B10	1	1800	3½x5	36x3½*	36x4*	I
Famous, B12	1½	2100	3¾x5	36x3½*	36x5*	I
Fargo, K	2	2500	3¾x5	36x4	36x6	W
Federal, SD	1	2500	3¾x5	35x5†	36x6†	W
Federal, TE	1½	2725	4⅛x5¼	36x3½	36x5	W
Federal, UE	2	3025	4⅛x5¼	36x4	36x7	W
Federal, WE	3½	3950	4½x5½	36x5	36x5d	W
Federal, X 2	5-6	5350	4¾x6	36x6	40x6d	W
Ford, TT	1	445	3¾x4	30x3½*	32x4½*	W
Forschler, A	1	....	3½x5	34x3	34x4	W
Forschler, AX	1½	....	3½x5	36x3½	36x5	W
Forschler, B	2	....	4¼x5¼	36x4	36x7	W
Forschler, BX	3	....	4½x5¼	36x4	36x8	W
Front Drive C	1½	2800	3¾x5½	5	4	W
Fulton, A	¾	1750	3½x5	35x5†	35x5†	B
Fulton, C	2	2350	3½x5	34x4	34x6	I
G & J**	2	3850	4x5¼	36x4	36x7	W
G & J**	3½	5175	4½x5½	36x5	36x5d	W
G.M.C., K16	1	1495	3½x5½	34x5†	34x5†	B
G.M.C., K41 A	2	3000-	4 x5½	36x4*	36x7*	W
G.M.C., K71 A	3½	4250	4½x6	36x5	40x5d	W
G M.C.,K101 A	5	4650	4½x6	36x5	40x6d	W
G.W.W.	1½	2100	3¾x5½	35x5	35x5	I
Garford, 15	¾	1590	3⅝x5½	34x5†	34x5†	W
Garford, 25	1¼	2090	3¾x5½	36x3½	36x4	W
Garford, 70-H	2	3190	4¼x5½	36x4	36x7	W
Garford, 68D	5	5200	5 x6½	36x6	40x6d	W
Garford, 77D	3½	4390	4½x6	36x5	36x6d	W
Garford, 150-A	7½	5500	5x6½	36x6	40x7d	C
Gary, F	1	2109	3¾x5	36x3½	36x4	W
Gary, I	1½	2550	4 x5½	36x3½	36x5	W
Gary, J	2½	$3150	4¼x5½	36x4	36x7	W
Gary, K	3½	4050	4½x6	36x5	40x5d	W
Gary, M	5	5150	5 x6½	36x6	40x6d	W
Gersix M	1½	3100	4 x5½	36x3½	36x7	W
Gersix K	2½	3500	4½x5½	36x4	36x8	W
Gersix	3½	4500	4½x6	36x5	40x12	W
Giant, 15-A	1½	2250	3¾x5	34x3½	34x5	W
Giant, 16	2	3050	4⅛x5¼	36x4	36x7	W
Giant, 17	3½	4150	4½x5½	36x5	36x5d	W
Globe D-20	¾	1495	3⅜x5	33x4½†	33x4½†	B
Globe	1	1495	3⅜x5	33x5	33x5	B
Golden West, GH	3	5000	4½x6	36x7	36x7	W
Golden West, G	3½	4500	4½x5½	36x6	36x6	W
Golden West, H	3½-4	5000	4½x6	36x6	36x6	W
Golden West, T	4	5500	4¾x6	36x6	36x6	W
Golden West, K	7	6000	5½x6	36x6	36x6	W
Golden West, HA	7	6000	4½x6	36x6	36x10	W
Gove, A-1	2½	....	4⅛x5¼	36x4*	36x7*	I
Graham Bros. A	1½	2495	3¾x5	35x5†	36x6†	I
Gramm-Bern., 10	1	1495§	3½x5	33x5†	33x5†	B
Gramm-Bern., 15	1½	2050§	3¾x5	36x3½*	36x5*	I
Gramm-Bern., 65	1½	2725§	3¾x5	36x3½*	36x5	W
Gramm-Bern., 20	2	3175§	4¼x5½	36x4*	36x7*	W
Gramm-Bern., 25	2½	3575§	4¼x5½	36x4*	36x4d*	W
Gramm-Bern., 35	3½	4375§	4½x5½	36x5	40x5d*	W
Gramm-Bern., 50	5	5275§	4¾x6	36x6	40x6d*	W
Hahn, J4	1	....	3¾x5	34x5*	34x5*	W
Hahn, CD	1½	....	4⅛x5¼	36x3½*	36x6*	W
Hahn, EE	2½	....	4½x5½	36x4*	36x8*	W
Hahn, F	3½	....	4½x5½	36x5*	36x10*	W
Hahn, EF	5	....	4¾x6	36x6	40x12	W
Hal Fur, E	1	2350	4 x5	35x5†	35x5†	W
Hal Fur, B	2½	3250	4¼x5½	35x5*	38x7*	W
Hal Fur, F	3½	4250	4½x5½	36x6†	40x10†	W
Hall	1½	3100	3¾x5	34x5†	38x7†	W
Hall	2½	3275	4⅛x5¼	36x4	36x6	W
Hall	3½	4100	4½x5½	36x5	36x5d	W
Hall	5	5100	4½x5½	36x5	40x6d	W
Hall	7	5100	4½x5½	36x5	40x6d	C
Harvey, WEA	1½	2550	4½x5½	34x3½	34x5	W
Harvey	3	2950	4½x5½	34x4	34x7	W
Harvey, WFA	2½	3300	4¼x5½	36x4	36x7	W
Harvey, WHA	3½	3950	4½x6	36x5	36x5d	W
Harvey, WKA	5	4500	4½x6	36x6	40x6d	W
Hawkeye, K	1½	1850	3¾x5¼	34x3½*	34x5*	I
Hawkeye, M	2	2650	4¼x5½	36x4*	36x6*	I
Hawkeye, N	3½	3700	4½x6	36x5*	36x10*	I
Hendrickson, N	2½	3150	4¼x5¾	36x4*	36x7*	W
Hendrickson, M	3½	3975	4½x5¾	36x5*	36x5d*	W
Highway, Knight A	4	....	4 x6	36x5	36x6d	W
Highway, Knight B	5	....	4 x6	36x5	40x6d	W
Higrade, A17	¾	1850	3½x5	32x4½	32x4½	W
Higrade, A18	1	2100	3½x5	35x5†	35x5†	W
Higrade, B20	1½	2500	4½x5¼	35x4†	36x6†	W
Huffman, B	1½	1995	3¾x5	34x3½	34x6	W
Huffman, C	1½	1795	3¾x5½	34x3½	34x6	I
Hurlburt	1½	....	4 x5½	34x4	34x5	W
Hurlburt	2½	....	4¼x5½	36x4	36x4d	W
Hurlburt	3½	....	4½x6	36x5	36x5d	W
Hurlburt	5	....	4½x6	36x5	40x6d	W
Huron Erie	1½	2425	3¾x5¼	36x3½	36x5	I
Huron Mich.	2½	2950	4¼x5½	36x4	36x7	I
Indep'd't(Iowa), B	1	1665	3½x5	34x3½	34x4	W
Indep'd't(Iowa), G	1½	2010	3¾x5¼	34x3½	34x5	I
Indep'd't(Ia.),H.I.	2½	2940	4½x5¼	34x4	34x6	I
Indep'd't(Ohio), F	1½	2585	3¾x5	36x3½	36x5	W
Indep'd't(Ohio) H	2½	2985	4½x5¼	36x4	36x4d	W
Indep'd't(Ohio) K	3½	3985	4½x5½	36x5	36x5d	W
Indiana, 12	1½	2290	3¾x5¼	34x3½*	34x5*	W
Indiana, 20	2	2950	4½x5½	36x4*	36x7*	W
Indiana, 25	2½	3150	4½x5½	36x4*	36x8*	W
Indiana, 35	3½	3750	4⅝x5½	36x5*	36x5d*	W
Indiana, 51	5	4795	5 x6¼	36x5*	40x6d*	W
Inland, D	2	2950	4 x5	34x5	34x6	I
International, S	¾	1500	3½x5	34x5†	34x5†	I
International, 21	1	1750	3½x5¼	36x3½	36x3½	I
International, 31	1½	1850	3½x5¼	36x3½	36x4	I
International, 41	2	2100	3½x5¼	36x3½	36x5	I
International, 61	3	2400	4¼x5	36x4	36x6	I
International, 101	5	3600	4¾x5	36x5	40x10	I
J & J, D	2	3250	4 x5	34x4*	34x6	I
Jackson, 4WD	3½	3850	4½x5½	36x7	36x7	B
Jumbo, 15	1½	2425	3¾x5¼	36x3½	36x5	I
Jumbo, 20	2	2675	3¾x5¼	35x5†	38x7†	I
Jumbo, 25	2½	3090	4½x5½	36x4	36x7	I
Jumbo, 30	3	3590	4¼x5½	36x6†	42x9†	I
Jumbo, 35	3½	4080	4½x6	36x5	36x10†	I
Jumbo, 40	4	4730	4½x6	38x7†	44x10	I
K-Z, 1	1	2250	3½x5	34x3½	34x5	W
K-Z, 1½	1½	2750	3¾x5	36x4	36x6	W
K-Z, 2½	2½	3250	4⅛x5¼	36x4	36x8	W
K-Z, 3½	3½	4250	4½x5½	36x5	40x10	W
K-Z, 5	5	5200	4½x5½	36x6	40x6d	W
Kalamazoo, G-1	1½	2495	3¾x5	34x4	34x5	W
Kalamazoo, G-2	1½	2800§	3¾x5	36x5	36x6	W
Kalamazoo, H	2½	3275§	4 x6	36x4	36x8	W
Kalamazoo, K	3½	4000§	4½x6	36x5	36x10	W
Kalamazoo, K-5	5	4500§	4½x6	36x6	36x6d	W
Karavan, A	2½	3900	4¼x6	36x4	36x8	W
Kearns, H	¾	1600	3½x4½	32x4½†	32x4½†	I
Kearns, N	1½	2200	3½x5	34x3½	34x6	I
Kelly-S., K-31*	1½	2900	3¾x5¼	36x3½	36x6	C
Kelly-S., K-34	1½	2900	3¾x5¼	36x3½	36x6	W
Kelly-S., K-38	2½	3250	3¾x5½	36x4	36x4d	W
Kelly-S., K-35	2½	3250	3¾x5½	36x4	36x4d	C
Kelly-S., K-40	3½	4200	4½x6½	36x5	40x5d	C
Kelly-S., K-41	3½	4200	4½x6½	36x5	40x5d	I
Kelly-S., K-42	3½	4200	4½x6½	36x5	40x5d	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††—Price includes body. §—Price includes several items of equipment.

*Kelly-Springfield.

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Kelly-S., K-45	4	$4550	4½x6½	36x5	40x6d	C
Kelly-S., K-50	5	4900	4½x6½	36x6	40x6d	C
Kelly-S., K-60	6	5100	4½x6½	36x6	40x7d	C
Keystone, 40	2	2450	3¾x5¼	34x5†	38x7†	I
Kimball, AB	2	3675	4 x6	36x4	36x7	W
Kimball, AC	2½	3975	4¼x6	36x4	36x8	W
Kimball, AK	3	4500	4½x6	36x4	36x10	W
Kimball, AE	4	5000	4¾x6	36x5	40x12	W
Kimball, AF	5	5975	5 x6	36x6	40x7d	W
Kissel, Express	1	1985††	37/8x5½	34x5†	34x5†	W
Kissel, Utility	1½	2775	37/8x5½	36x3½	36x5	W
Kissel, Freighter	2½	3475	4¼x5½	36x4	36x7	W
Kissel, H. D.	4	4475	4¼x5½	36x5	36x5d	W
Kleiber, AA	1	2600	4¼x5¼	34x3½*	34x5*	W
Kleiber, A	1½	3100	4¼x5¼	36x3½*	36x6*	W
Kleiber, BB	2	3600	4½x5¼	36x4*	36x7*	W
Kleiber, B	2½	3950	4½x5¼	36x5*	36x8	W
Kleiber, C	3½	4600	4½x5½	36x5	36x5d	W
Kleiber, D	5	5300	5 x6½	36x6	40x12	W
Koehler, D	1½	1888	3½x5	34x3½	34x5	W
Koehler, M	2½	2875	4 x5½	36x4	36x7	W
Koehler, MCS	2½	2975	4 x5½	36x4	36x7	W
Koehler, F	3½	3985	4½x5½	36x5	36x10	W
Koehler, MT, Trac	5	2975	4 x5½	36x4	36x7	W
L.M.C., 2-20	2½	2540	4½x5¼	36x4	36x4d	I
Lange, B	2½	3350	4¼x5¼	36x4*	36x6*	C
Larrabee, XZ	¾-1	1925	3¼x4½	34x5†	34x5†	B
Larrabee, U	1½	2400	3¾x5	34x3½	34x5	W
Larrabee, SK	2½	3200	4½x5¼	36x4	36x7	W
Larrabee, FL	3½	4000	4½x5½	36x5	36x5d	W
Larrabee, FW	5	4800	4¾x6	36x6	40x6d	W
Lion, L	1	2350	3¾x5½	35x5†	35x5†	W
Luedinghaus, C	1	2100	3½x5	35x5†	35x5†	W
Luedinghaus, W	1½	2700	3¾x5¼	34x3½*	34x5*	W
Luedinghaus,	2-2½	3150	4¼x5¾	36x4*	36x7*	W
Maccar, L	1½	2925	4½x5¼	36x4	36x6	W
Maccar, H-2	2½	3650	4½x5½	36x4	36x4d	W
Maccar, M-2	3½	4500	4½x6	36x5	36x5d	W
Maccar, G	5	5500	4¾x6	36x5	40x6d	W
MacDonald, A	7½	5750	4½x6	40x7	40x14	I
Mack, AB D.R.	1½	3450	4 x5	36x4	36x3½d	D
Mack, AB	2½	3400	4 x5	36x4	36x4d	C
Mack, AB Chain	1½	3000	4 x5	36x4	36x3½d	C
Mack, AB Chain	2	3300	4 x5	36x4	36x4d	C
Mack, AB D.R.	2	3750	4 x5	36x4	36x4d	D
Mack, AC Chain	3½	4950	5 x6	36x5	40x5d	C
Mack, AC Chain	5	5500	5 x6	36x6	40x6d	C
Mack, AC Chain	6½	575\	5 x6	36x6	40x12	C
Mack, AC Chain	7½	6006	5 x6	36x7	40x7d	C
Mack Trac., AB	5	3406	4 x5	36x4	36x4d	C
Mack Trac., AC	7	4950	5 x6	36x5	40x5d	C
Mack Trac., AC	10	5500	5 x6	36x6	40x6d	C
Mack Trac., AC	13	6750	5 x6	36x6	40x12	C
Mack Trac., AC	15	6000	5 x6	36x7	40x7d	C
Mapleleaf, AA**	2	4150	4 x5¼	36x4	36x7	W
Mapleleaf, BB**	3	4775	4¼x5½	36x4	36x4d	W
Mapleleaf, CC**	4	5770	4½x5½	36x5	36x5d	W
Mapleleaf, DD**	5	6825	4½x5½	36x6	40x6d	W
Master, JW	1½	2690	4½x5½	34x3½	34x5	W
Master, W	2½	3290	4¼x5½	34x4	36x7	W
Master, D	2½	3540	4¼x5½	34x4	36x7	D
Master, A	3½	4190	4½x6	36x5	40x5d	W
Master, E	3½	4640	4½x6	36x5	40x5d	D
Master, B	5	5290	4¾x6½	36x6	40x6d	W
Master, F	5	5440	4¾x6½	36x6	40x6d	D
Master Trac., T	6	3740	4¼x5½	34x4	36x7	D
Maxwell, 1½	1½	1332	3⅝x4¼	32x3	32x4	W
Menominee, HT	1	2080	3¾x5	34x3½	36x5	W
Menominee, H	1½	2725	4 x5	36x3½	36x5	W
Menominee, D	2	3245	4 x6	36x4	36x8	W
Menominee, G	3½	4270	4½x6	36x5	36x10	W
Menominee, J3	5	5450	4¾x6	36x6	40x12	W
Moline, 10	1½	2450	3½x5	34x5†	36x6†	I
Moreland, 20N	1	2850	3¾x5	35x5†	36x6†	I
Moreland, 21B	1½	2800	4½x5¼	36x3½	36x6	W
Moreland, 21C	2½	3500	4½x5½	36x4	36x8	W
Moreland, 21H	3½	4600	4¾x6	36x5	40x5d	W
Moreland, 21J	5	5000	4¾x6	36c6	40x6d	W
Napoleon, 79	¾-1	1350	3½x5	38x4	33x4†	I
Napoleon, XX-7	1	1535	3¾x5	35x5*	35x5*	I
Napoleon, 11	1½	1860	3½x5	35x5*	36x6*	I
Nash, 2018	1	1895	3¾x5¼	34x5	36x6	I
Nash, 3018	2	2550	3¾x5¼	36x6	40x8	I
Nash, Quad.	2	3250	4¼x5½	40x8	40x8	I
*Nelson, F1½	1½	....	4½x5¼	36x3½	36x5	W
*Nelson, F2	2	....	4½x5¼	36x4	36x7	W
*Nelson, F3½	3½	....	4½x5½	36x5	36x5d	W
*Nelson, FCS	5	....	4¾x6	36x6	40x6d	W
Netco, D	2	3100	4¼x5¼	36x4*	36x7*	W
Netco, H	2½	3500	4½x5½	36x4*	36x8*	W
New York, M	1½	....	4½x5¼	36x3½	36x5	W
New York, N	2-2½	....	4½x5¼	36x4	36x4d	W
Niles, E	2	3000	4½x5¼	36x4*	36x7*	W
Noble, B30	1½	2400	3¾x5¼	36x3½	36x5	W
Noble, C40	2	2675	4 x5½	36x4	36x7	W
Noble, D50	2½	2950	4¼x5½	36x4	36x8	W
Noble, E70	3½	3800	4½x6	36x5	36x10	W
Northway, B-2	2	3400	4 x6	36x4	36x4d	W
Northway, B-3	3½	4400	4 x6	36x5	40x5d	W
Northwestern W	1½	2750	4¼x5¼	34x4	36x6	W
Northwestern WS	2½	3500	4½x5½	36x4	36x8	W
Norwalk, 25E	1	1695	3½x5	34x3½	34x4	W
Norwalk, 35E	1½	2025	3½x5	34x3½	34x3½d	W
Norwalk, 35E, Spec	1½	2285	3¾x5¼	34x3½	34x5	W
O. K., K1	1½	2675	4 x5½	36x3½	36x5	W
O. K., L1	2½	3450	4¼x5½	36x4	36x8	W
O. K., M1	3½	4250	4½x6	36x5	36x5d	W
Ogden, A1	1½	2550	3¾x5	36x3½	36x5	W
Ogden, E	2½	$3250	4½x5¼	36x4	36x7	W
Old Hickory, W	1	2175	3¾x5	36x3½*	36x4*	W
Old Reliable, A	1½	2350	4 x5	34x4	36x6	W
Old Reliable, B	2½	3500	4¼x6	34x4	36x4d	W
Old Reliable, C	3½	4250	4¼x6	36x5	36x5d	W
Old Reliable, D	5	5250	4¾x6	36x6	40x6d	W
Old Reliable, KLM	7	6000	4¾x6¼	36x6	40x7d	C
Oldsmobile Econ.	1	1095	3⅛x5¼	35x5†	35x5†	I
Olympic, A	2½	3500	4¼x5½	36x4	36x7	W
Oneida, A-9	1¼	2350	3¾x5½	36x3½	36x5	W
Oneida, B-9	1¾	2915	4 x5¼	36x4	36x7	W
Oneida, C-9	2½	3390	4 x5¼	36x4	36x7	W
Oneida, D-9	3½	4345	4½x5½	36x5	36x10	W
Oneida, E-9	5	5460	4½x5½	36x6	40x12	W
Oshkosh, A	2	3750	3½x5	36x6†	36x6†	4
Oshkosh, AA	2	3850	3½x5	36x6†	36x6†	4
Oshkosh, B	2¾	4150	4 x5½	38x7†	38x7†	4
Oshkosh, BB	2¾	4300	4 x5½	38x7†	38x7†	4
Packard, EC	....	3500	4⅞x5½	36x4	36x7	W
Packard, ED	....	4100	4½x5½	36x5	36x5d	W
Packard, EF	....	4500	5 x5½	36x6†	40x6d†	W
Packard, EX	....	4000	4⅞x5½	36x6†	40x8†	W
Paige, 52-19	1½	2880	4 x5¼	34x3½	34x5	W
Paige, 54-20	2½	3400	4¼x5½	34x4	34x8	W
Paige, 51-18	3½	4285	4½x5½	36x5	36x5d	W
Parker, F20	2	3500	4 x6	34x4	36x4d	W
Parker, J20	3½	4400	4½x6	36x5	40x5d	W
Parker, M20	5	5500	4¾x6	36x6	40x6d	W
Patriot, Revere	¾	1785	3¾x5	35x5†	35x5†	W
Patriot, Lincoln	1½	2450	4 x5¼	34x3½*	34x5*	W
Patriot, Washgt'n	2½	3450	4½x5½	36x4*	36x7*	W
Piedmont, 4-30	1½	1685	3½x5	34x4†	34x4†	W
Pierce-Arrow,	2	3200	4 x5½	36x4	36x4d	W
Pierce-Arrow	3½	4350	4½x6¾	36x5	36x5d	W
Pierce-Arrow	5	4850	4½x6¾	36x5	40x6d	W
Pioneer, 59	1	1550	3¾x4¼	32x4½†	32x4½†	W
Pittsburger, C-21	2½-3	3500	4½x5¼	36x5*	36x7*	W
Pony	¾	400	2¾x4	28x3†	28x3†	C
Power, F	1½	....	3¾x5¼	36x6	36x6	W
Power, C	3½	....	4¼x5½	36x5	40x10	W
Premocar, B-143	1½	2475	3½x5	36x6†	36x6†	W
Ranier, R-11	¾	2150	3½x5	35x5†	35x5†	W
Rainier, R-19	1	2350	3½x5	34x3½	31x4	W
Rainier, R-16	1½	2600	3¾x5	34x3½	34x5	W
Rainier, R-18	2	2950	4¼x5¼	34x4	34x6	W
Rainier, R20	2½	3600	4½x5¼	34x4	34x7	W
Rainier, R-15	3½	4500	4½x5½	36x5	36x5d	W
Rainier, R17	5	5250	4½x6	36x6	36x6d	W
Ranger, TK-20-2	2	....	3¾x5	36x6†	36x6†	W
Reo, F	¾-1½	1385	4½x4½	34x4½†	34x4½†	B
Reliance, 10A	1½	2400	4 x5½	36x3½	36x5	I
Reliance, 20B	2½	3100	4¼x6½	36x4	36x4d	I
Republic, 75	¾	1395††	3¾x5	32x4½	32x4½	I
Republic, 10	1	1695	3¾x5	35x5†	35x5†	I
Republic, 10Exp.††	1	2095	.....	35x5†	35x5†	I
Republic, 11X	1½	2295	3¾x5	34x3½	34x5	I
Republic, 19	2½	2795	4¼x5¼	36x4	36x7	I
Republic, 20	3½	3845	4½x5¾x	36x5	36x10	I
Rowe, CW	1½	3000	3¾x5	36x6†	36x6†	W
Rowe, C. D. W.	2	3300	4 x5	34x4	36x3½‡	W
Rowe, G. S. W.	3	4150	4 x6	34x5	36x5d	W
Rowe, G. P. W.	3	5250	3¼x5‡	38x7†	42x9†	W
Rowe, HW	4	4500	4¼x6	36x5	36x6d	W
Rowe, F. W.	5	5500	4½x6	36x6	40x6d	W
Rumely, A	1½	2720	3¾x5¼	36x3½	36x5	W
Samson, KO 15	¾	865	3⅛x4	32x4	32x4	B
Samson, E 25	1¼	1395	3⅛x5½	35x5	35x5	B
Sandow, G	1	2295	3¾x5	34x3½	34x5	W
Sandow, CG	1½	2590	3¾x5	34x4	34x6	W
Sandow, J	2½	3275	4¼x5¼	36x4	36x7	W
Sandow, M	3½	4295	4½x5½	36x5	36x5d	W
Sandow, L	5	4975	4½x5½	36x6	40x6d	W
Sanford, 25	2½	3350	4¼x5¼	36x4	36x4d	W
Sanford, 35	3½	4200	4½x5½	36x5	36x5d	W
Sanford, 50	5	5100	4¾x6	36x5	40x6d	W
Schacht, 2-Ton	2	....	4¼x5½	36x4	36x7	W
Schacht, 2½-Ton	2½	....	4¼x5½	36x4	36x4d	W
Schacht, 3½-Ton	3½	....	4¼x6	36x5	36x5d	W
Schacht, 5-Ton	5	....	4½x6	36x5	40x6d	W
Schwartz, A	1	1685	3½x5	33x4½†	33x4½†	B
Schwartz, BW	1½	2600	3¾x5¼	34x3½*	34x7*	W
Schwartz, C.W.S.	2½	3200	4¼x5½	36x4	36x8	W
Schwartz, DW	5	4900	4½x6	36x6	40x12	W
Selden, 1½A	1½	2360	3¾x5	34x3½	34x5	W
Selden, 2½A	2½	3425	4½x5¼	36x4	36x7	W
Selden, 3½A	3½	4175	4½x5½	36x5	36x10	W
Selden, 5A	5	5600	4¾x6	36x6	40x12	W
Seneca, M	½	1020	3½x4½	30x3½†	30x3½†	B
Service, 15	¾-1	1840	3⅝x5	34x4½	35x5	B
Service, 22S	1	2415	3½x5½	34x3½	34x5	W
Service, 31	1½	2985	4 x5½	36x3½	36x6	W
Service, 36	1½	3415	4¼x5½	35x5†	38x7†	W
Service, 51	2½	3475	4¼x5½	36x4	36x7	W
Service, 71	3½	4285	4¼x5½	36x5	36x5d	W
Service, 76	3½	$4485	4½x6	36x5	36x5d	W
Service, 101	5	5275	4½x6	36x6	40x6d	W
Signal, NF	1	2475	4¾x5	34x5†	36x6†	W
Signal, H	1½	2925	4½x5¼	34x4	36x6	W
Signal, J	2½	3275	4½x5¼	34x4	36x8	W
Signal, M	3½	4275	4½x5½	36x5	40x5d	W
Signal, R	5	5300	4¾x6	36x6	40x6d	W
Southern, 10	1	2090	3¾x5	34x3½	31x4	W
Southern, 15	1½	2590	3¾x5½	36x6†	34x4	W
Southern, 20	2	2990	4¾x5¼	36x6†	40x8*	W
Standard, 1-K	1-1½	1950	3¾x5	34x3½*	34x5*	W
Standard, 76	2½-3	3100	4½x5¼	36x4*	36x7*	W
Standard, 66	3½-4	4000	4½x5½	36x5	36x10	W
Standard, 5-K	5-7	5250	4¾x6	36x6	40x12	W
Sterling, 1½	1½	3200	4 x5¾	36x3½	36x5*	W
Sterling, 2	2	3500	4 x5¾	36x4	36x6	W
Sterling, 2½	2½	3650	4⅜x5¾	36x4*	36x4d*	W
Sterling, 3½	3½	4650	4½x6¼	36x5*	40x5d*	W
Sterling, 5-W	5	5500	5 x6¼	36x6*	40x6d*	W
Sterling, 5-C	5	6000	5 x6¼	36x6	40x6d	C
Sterling, 7½	7½	6500	5 x6¼	36x6	40x7d	C
Stewart, 14	¾	1395	3⅝x5½	32x4½†	32x4½†	I
Stewart, 15	1	1875	3½x5	35x5†	35x5†	I
Stewart, 9	1½	2200	3¾x5	34x3½	34x5	I
Stewart, 7	2	2800	4¼x5¼	34x4	34x7	I
Stewart, 7-X	2½	2950	4¼x5½	34x4	34x7	I
Stewart, 10	3½	3850	4½x5½	36x5	36x5d	I
Stewart, 10-X	3½	3850	4½x6	36x5	36x5d	I
Stoughton, A	1	1995	3¾x5¼	34x4½†	35x5†	W
Stoughton, B	1½	2350	3¾x5¼	36x3½	36x5	W
Stoughton, C	¾	1240	3½x5	34x4½†	34x4½†	W
Stoughton, D	2	2800	4 x5⅛	36x4	36x7	W
Stoughton F	3	3600	4¼x5½	36x5d	36x5d	W
Sullivan, E	2	3350	4¼x5½	36x4*	36x7*	W
Sullivan, H	3½	4650	4½x6	36x5	36x5d	W
Superior, D	1	1650	3¾x5	34x4½†	34x4	I
Superior, E	2	2600	4½x5¾	36x4	36x6	I
Super Truck, 50	2½	3300	4 x6	36x4	36x8	W
Super Truck, 70	3½	4300	4¼x6	36x5	40x5d	W
Super Truck, 100	5	5300	4¾x6	36x5	40x12	W
Super Truck 150	7½	6300	5 x6	36x6	40x7d	W
Texan, A38	¾	1095	3½x5	33x4	33x4	I
Texan, TK39	1½	1550	3½x5	36x6	38x7	W
Tiffin, GW	1½	2400	4⅛x5¼	36x3½	36x5	W
Tiffin, MW	2½	3100	4⅛x5¼	36x4	36x3½d	W
Tiffin, PW	3½	4100	4½x5½	36x5	40x5d	W
Tiffin, F50	5	4800	4¾x6	36x6	40x6d	W
Tiffin, F60	6	5000	4¾x6	36x6	40x12	W
Titan, HT	3½	4550	4½x6	34x4*	40x5d	I
Titan, HD	5	5100	4½x6	36x5	40x6d	I
Titan, TS	2½	3400	4¼x5½	34x4*	36x4d	I
Tower, J	1½	3000	4½x5¼	35x5	38x7	W
Tower, H	2½	3475	4½x5¼	36x4	36x7	W
Tower, G	3½	4400	4½x5½	36x5	36x5d	W
Traffic, C	....	1595	3¾x5	34x3½*	34x5*	I
Traffic	3	1895	3¾x5†	36x4	36x7	I
Transport, 20	1	1395	3¾x5¼	34x3½	34x4	I
Transport, 30	1½	1995	3¾x5	36x3½	36x5	I
Transport, 50	2½	2785	4¼x5½	36x4	36x7	I
Transport, 70	3½	3895	4½x6	36x5	36x10	I
Traylor, B	1½	2390	3¾x5¼	34x3½	34x5	W
Traylor, C	2	2850	4 x5½	36x4	36x7	W
Traylor, D	3	3700	4¼x5½	36x4	36x8*	W
Traylor, E	4	4450	4½x6	35x5	40x10	W
Traylor, F	5	4700	4½x6	36x6	40x6d	W
Triangle, AA	¾-1	1385	3¼x5	34x4½†	34x4½†	I
Triangle, A	1½	2350	3¾x5¼	34x3½*	34x6*	I
Triangle, C	2	2700	3¾x5¼	36x4*	36x6*	I
Triangle, B	2½	2950	4 x5¾	36x4*	36x7*	I
Triumph, G	1	1995	3⅛x5½	34x5†	34x5†	W
Triumph, HC	1½	2550	3¾x5¼	36x3½	36x5	W
Triumph, HB	2	2900	3¾x5¼	36x4	36x7	W
Twin City, B.W.	2	2750	4 x5½	36x4	36x7	I
Twin City, A. W.	3½	4000	4¼x6	36x5	40x5d	W
Twin City, FWDB	3½	4750	5⅛x6	36x6	36x6	I
Twin City, FWDA	5	5250	5⅛x6	36x7	36x7	I
Ultimate, A	2	3200	4 x5½	36x3½	36x6*	W
Ultimate, AJ	2	3250	4¼x5½	35x5†	38x7†	W
Ultimate, B	3	3750	4¼x5½	36x4*	36x4d*	W
Ultimate, BL	3	3850	4¼x5½	36x4*	36x4d*	W
Union, F W	2½	3490	4 x6	36x5*	36x8*	D
Union, H W	4	4485	4½x6	36x6	40x12	D
Union, J W	6	5800	5 x6	36x6	40x14	D
United, A	1½	2445	3¾x5¼	36x3½*	34x5*	I
United, B	2½	3150	4¼x5½	36x4*	36x7*	I
United, C	3½	3975	4¼x5½	36x5	36x5d	I
United, V	5	5000	4½x6	36x6	40x6d	I
U. S., N	1½	1975	3¾x5	36x3½*	36x5*	I
U. S., R	3	3075	4 x5¼	36x4	36x4d	W
U. S., S	4	3875	4½x5½	36x5	36x5d	W
U. S., T	6	4850	4¾x6½	36x6	40x6d	W
Velie, 46	1½	1585	3¾x5	36x3½	36x5	I
Veteran, E**	1-1½	3500	3¾x5¼	35x5†	36x6†	W
Veteran, A**	2-2½	4000	4¼x5½	36x4*	36x7*	W
Veteran, D**	2½-3	4400	4¼x5½	36x4*	36x7*	W
Veteran, H**	3½-4	5600	4¼x6	36x5	36x5d	W
Vim, 29	½	1355	3½x4¼	31x4†	31x4†	W
Vim, 30	½	1550	3½x4½	32x4½	32x4½	W
Vim, 31	1	2475	3¾x5⅛	35x5†	35x5†	W
Vim, 22	2	3150	3¾x5⅛	36x4	36x6	W
Vim, 23	3	3950	4¼x5½	36x5	36x5d	W
Vulcan, 25	2½	4000	4¼x6	36x4	36x8	W
Vulcan, 25P	3	4500	4¼x6	36x6	40x8	W
Walker-Johnson, B	2½	3500	4¼x5½	36x4	36x8	W
Walter, S	5	5600	4½x6¼	36x6	40x6d	W
Ward-LaF., 2B	2½	3590	4⅜x5¾	36x4	36x7	W
Ward-LaF., 4A	3½	4690	4½x6¼	36x5	36x5d	W
Ward-LaF., 5A	5	5590	5 x6¼	36x6	40x6d	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††—Price includes body. ‡—Price includes several items of equipment.

*Nelson Le Moon

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Watson, E	1	$1865	3¾x5½	35x5†	35x5†	W
Watson, N	3½	4250	4½x5½	36x5	36x10	W
Western, W1½	1½	2550	4⅛x5¼	36x3½*	36x5*	W
Western, L1½	1½	2550	3⅝x5	36x3½*	36x5*	W
Western, W2½	2½	3250	4⅛x5¼	4x4	36x7	W
Western, L2½	2½	3250	4¼x6	36x4	36x7	W
Western, W3½	3½	4250	4½x6	36x5	40x5d	W
White, 15	¾	2400	3¾x5½	34x5†	34x5†	B
White, 20	2	3250	3¾x5⅛	36x4*	36x7	D
White, 40	3½	4200	3¾x5¾	36x5	40x5d	D
White, 45	5	4500	4¼x5¾	36x6	40x6d	D
White Hick., E	1	2450	3¾x5	34x5†	34x5†	W
White Hick., H	1½	2750	3¾x5	36x3½	36x5	W
White Hick., K	2½	3350	4½x5¼	36x4	36x5	W
Wichita, K	1	2300	3¾x5¼	36x3*	36x4*	W
Wichita, L	1½	2600	3¾x5¼	36x3½*	36x5*	W
Wichita, M	2	2800	3¾x5¼	36x3½*	36x6*	W
Wichita, R	2½	3000	3¾x5¼	36x4*	36x7*	W
Wichita, RX	2½	3600	4¼x6	36x4*	36x8*	W
Wichita, O	3½	4000	4¼x6	36x5*	36x5d*	W
Wichita, S	5	$5000	4½x6	36x6	40x6d	W
Wilcox, AA	1	2100	3¾x5½	36x4*	36x4*	W
Wilcox, B	1½	2775	4¼x5	36x4	36x5	W
Wilcox, D	2½	3300	4¼x6	36x4*	36x3½d*	W
Wilcox, E	3½	4250	4½x6	36x5*	36x5d*	W
Wilcox, F	5	5200	4¾x6½	36x5	40x6d	W
Wilson, F	1½	2270	3¾x5	36x3½	36x5	W
Wilson, EA	2½	2825	4½x5¼	36x4	36x7	W
Wilson, G	3½	3685	4½x6½	36x5	36x5d	W
Wilson, H	5	4520	4¾x6	36x6	40x6d	W
Winther, 751	1	1795	3½x5	34x4½†	35x5†	I
Winther, 430	1½	2850	3¾x5	32x4	32x4	I
Winther, 39	1½	$2450	3¾x5	34x3½	34x5	I
Winther, 49	2	3250	4 x5	34x4	34x4d	I
Winther, 50	2½	3995	4 x6	38x7†	42x9†	I
Winther, 70	3½	4200	4 x6	36x5	36x5d	I
Winther, 450	2½	3690	4 x5	34x5	36x6	I
Winther, 109	5	5250	4½x6	36x6	40x5d	I
Winther, 140	7	5900	5 x6	36x6	40x7d	I
Wisconsin B	1	1950	4 x5¾	34x5†	34x5†	W
Wisconsin C	1½	2500	4⅜x5¾	36x6†	36x6†	W
Wisconsin D	2½	3500	4½x6¼	36x6	36x10	W
Wisconsin E	3½	4000	5 x6¼	36x6†	36x12†	W
Witt-Will, N	1½	2750	3¾x5	36x3½*	36x5*	W
Witt-Will, P	2½	3250	4½x5¼	36x3½*	36x7*	W
Wolverine, J	1	2125	3½x5	34x3	34x4	I
Wolverine, J	1½	2375	3¾x5	34x3½	34x5	I
Wolverine, J	2	2640	3¾x5	34x4	34x7	I
Wolverine, J	2½	3425	4⅛x5¼	36x5	36x10	I
Wolverine, L	3½	4100	4½x5½	36x5	36x10	I
Yellow Cab M21	¾	2050	3¾x5	32x4	32x4	B
Yellow Cab M41	1¼	2350	3¾x5	34x4½	34x4½	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ‡†—Price includes body. §—Price includes several items of equipment.

Farm Tractor Specifications and Prices

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity
All-In One	16-30	$1975	3	Clim.	4-5 x6½	GDK	3-4
Allis-Chalm. B	6-12	925	2	LeR.	4-3⅛x4½	Gas.	1
Allis-Chal. G.P	6-12	850	2	LeR.	4-3⅛x4½	Gas.	1-2
Allis-Chalm.	12-20	1495	2	Mid.W	4 4⅛x5¼	Gas.	2-3
Allis-Chalm.	18-20	2150	4	Own	4-4¾x6½	GorK	3-4
Allis-Chalm	10-18	875	4	Own	4-4⅜x6½	G,K	4
Allwork...2-G	14-28	1875	4	Own	4-4¾x6	GorK	3
Allwork...C	14-28	1675	4	Own	4-5 x6	GorK	3
AndrewsKin.D	18-36	2500	4	Clim.	4-5 x6½	GorK	4
Appleton	12-20	1500	4	Buda	4-4¼x5½	G,K	2-3
Aro.....1921	3-5	550	4	Own	1-4½x5	Gas.	1
Aultman-T.	15-30	2200	4	Clim.	4-5 x6½	G,K	4
Aultman-T.	22-45	3850	4	Own	4-5½x8	G,K	6
Aultman-T.	30-60	5000	4	Own	4-7 x9	G,K,D	8
Automot. B-3.	12-24	1785	4	Hen	4-4 x5½	Gas.	2-3
Avery.SR.Cul.	5-10	....	4	Own	4-3 x4	G,K	..
Avery...Cult-C	....	....	3	Own	6-3 x4	G,K	..
Avery.....B	5-10	....	4	Own	4-3 x4	G,K	2
Avery.....C	....	....	4	Own	6-3 x4	G,K	..
Avery.....	8-16	....	4	Own	2-5½x6	G,K,D	2-3
Avery.....	12-20	....	4	Own	4-4¾x6	G,K,D	2-3
Avery.....	12-25	....	4	Own	2-6½x7	G,K,D	3-4
Avery.....	14-28	....	4	Own	4-4⅞x7	G,K,D	3-4
Avery.....	18-36	....	4	Own	4-5½x6	G,K,D	4-5
Avery.....	25-50	....	4	Own	4-6½x7	G,K,D	5-6
Avery.....	45-65	....	4	Own	4-7¾x8	G,K,D	8-10
Bates	15-25	....	4	Own	4-4¼x6	Ker.	3
Bates Mule H	15-25	....	4	Midw	4-4⅛x5¼	Gas.	3
Bates Mule F	18-25	....	*2	Midw	4-4⅛x5¼	Gas.	3
Bates Mule G	25-35	....	*2	Midw	4 4½x6	Gas.	com.
Bean	8-16	....	*1	Own	4-3⅞x4	G,K	2-3
Beeman...G	2-4	315	4	Own	1-3⅛x4½	Gas.	½
Best	30	....	*2	Own	4-4¾x6½	G,K,D	4
Best	60	....	*2	Own	4-6½x8½	G,K,D	8-9
Boring.....1921		1850	3	Wauk	4-4⅜x5¾	GorK	2
Burn-Oil.1921	15-30	1650	4	Own	2-6¾x7	Ker.	3-4
Capital	15-30	1000	2	Own	4-4⅜x6	Gas.	3
Case	10-18	1090	4	Own	4-3⅞x5	GorK.	2
Case	15-27	1680	4	Own	4-4½x6	GorK	3
Case	22-40	3100	4	Own	4-5½x6¾	GorK	4-5
Caterpillar T11	25	4250	*2	Own	4 4¾x6	Gas.	4
Caterpillar T16	40	6500	*2	Own	4-6½x7	Gas.	6
Centaur	5-2½	455	2	NWay	2-4½x4½	G or K	1-9
Chase	12-25	1725	3	Buda	4-4¼x5½	GorK	2-3
Chicago....40	40	2500	4	Own	4-4½x6	Gas.	4
Cletrac.....F	9-16	845	*2	Own	4-3¼x4¼	G,K,D	2
Cletrac.....W	12-20	1495	*2	Own	4-4 x5½	G,K,D	2-3
Da'kota.....4	15-27	1750	3	Dom.	4-4¾x6	Gas.	3
Dart.....B.J.	15-30	2100	4	Buda	4-4½x6	Gas.	3-4
Depue.....A	20-30	2500	4	Buda	4-4½x6	Gas.	4
Dill.....D	20	2480	4	Cont.	4-4½x5½	Gas.	3
Dill.....R.W.	20-	2980	4	Midw	4-4½x6	Gas	3
Do-It-All.....	-7	595	..	Own	1-4½x5	Gas.	..
Eagle.....F	12-22	1100	4	Own	2-7 x8	GorK	3-4
Eagle.....F	16-30	1850	4	Own	2-8 x8	GorK	4-5
E-B.....AA	12-20	1445	4	Own	4-4¾x5	G,K,D	3
E-B.....Q	12-20	925	4	Own	4-4¾x5	G,K,D	3
E-B.....	16-32	2000	4	Own	4-5¼x7	G,K,D	4
Evans	18-30	2000	4	Buda	4-4½x6	G,K	3
Fageol.....D	9-12	1525	4	Lyc.	4-3½x5	Gas.	2
Farm Horse. B	18-30	1885	4	Clim.	4-5 x6½	G,K	3-4
Farquhar	15-25	....	4	Buda	4-4½x6	G,K,D	3-4
Farquhar	18-35	....	4	Own	4-6 x8	G,K,D	4-5
Farquhar	25-50	....	4	Own	4-7 x8	G,K,D	6-7
Fitch.....4	20-35	....	4	Clim.	4-5 x6½	GorK	3-4
Flour City	20-35	....	4	Own	4-5¼x6	Ker.	4-6
Flour City	30-50	....	4	Own	4-6¾x7	Ker.	6-8
Flour City	40-70	....	4	Own	4-7½x9	Ker.	8-1
Fordson	....	625	4	Own	4-4x5	G,K	2
Fox.....E	20-40	3100	4	Own	4-5½x7½	G or K	4
Franklin....G	18-30	4000	*2	Clim.	4-5 x6½	G or K	3-3
Franklin....C	18-30	3350	*2	Clim.	4-5x6½	G or K	3-4
Franklin..G 2	18-30	4350	2	Clim.	4-5 x6½	G or K	3-4
Frick.....A	12-20	1200	4	Erd.	4-4 x6	G,K	2-3
Frick.....C	15-28	1600	4	Beav.	4-4¾x6	G,K	3-4
G-O.....G	14-28	1485	4	Wauk.	4-4½x5¾	GorK	3
Grain Belt..A	18-36	2150	4	Wauk.	4-4¾x6¾	GorK	4
Gray.....1920	18-36	$2000	3	Wauk	4-4¾x6¾	Gas.	4
Ground Hog	19-31	2000	4	Erd.	4-4 x6	GorK	3
Gt. Western St	20-30	1950	4	Beav.	4-4¾x6	K.	4
Hart-Parr...20	20	995	4	Own	2-5¼x6½	K.D	2
Hart-Parr...30	30	1595	4	Own	2-6½x7	K,D	3
Heider.....D	9-16	1170	4	Wauk	4-4¼x5¾	G,K	2
Heider.....C	12-20	1395	4	Wauk	4-4½x6¾	G,K	3
Heider...Cult	6-10	1050	4	LeR.	4-3½x4½	Gas.	1
Hicks	20-30	....	4	....	4-4½x6	KorG	4
Huber Light 4	12-25	1185	4	Wauk	4-4½x5¾	GorK	3
Huber Super 4	15-30	1885	4	Midw.	4-4½x6	Gas.	3
Illinois, Super-Drive.....C	18-36	2375	4	Clim.	4-5 x6½	G,K	4
Imperial.....E	40-70	5000	4	Own	4-7½x9	G,K,D	10
Indiana.....F	5-10	895	2	LeR.	4-3⅛x4½	Gas.	1-2
International.	8-16	900	4	Own	4-4¼x5	G,K,D	2
International.	15-30	1750	4	Own	-5¼x8	G,K,D	4
J-T.....N	20-40	3435	*2	Chief	4-4¾x6	G,K,D	3-4
Klumb.....F	16-32	1650	4	Clim.	4-5 x6½	....	..
Knudsen, 1920	25-45	2500	4	Own	4-5 x9	Gas	4-6
LaCrosse...M	6-12	650	4	Own	2-4 x6	G,K	1
LaCrosse...G	12-24	985	4	Own	2-6 x7	GorK	3
Lauson	12-25	1495	4	Midw	4-4⅛x5¼	Gas.	3
Lauson	15-25	1685	4	Beav.	4-4½x6	GorK	3-4
Lauson.....21	15-30	1985	4	Beav.	4-4¾x6	GorK	3-4
Lauson Road	15-30	2225	4	Beav.	4-4¾x6	K.	....
Leader.....B	12-18	1095	4	Own	2-6 x6¼	G,K,D	2-3
Leader.....N	16-32	1985	4	Clim.	4-5 x6½	G,K	3-4
Leader....GU	18-35	2775	*2	Clim.	4-5x6½	G,K	3-4
Leonard.....E	20-30	2530	4	Buda	4-4½x6	G,K	3
Liberty.....A	18-32	2475	4	Clim.	4-5 x6½	G,K	4
Linn.....H4J	40-	4500	*	Cont.	4-4½-5½	Gas	4
Linn.....W	60	5100	*	Wauk.	4-5 x6¼	Gas.	6
Little Giant..B	16-22	2200	4	Own	4-4½x5	K.	4
Little Giant..A	26-35	3300	4	Own	4-5½x6	K.	6
Lombard.....	85-150	....	*2	....	6-5½x6¾	Gas.	16
Lombard.....	50	....	*2	....	4-4¾x6½	....	6-10
Magnet.....B	14-28	1875	4	Wauk	4-4½x6¼	K&G	3
Master Jr	5-10	585	..	LeR.	-3½x4	Gas.	1
Merry Gar1921	2	230	2	Evin	1-2⅝x2½	Gas.	..
Minne...All-P	12-25	1230	4	Own	4-4½x7	GorK	3
Minne. Gen.P.	17-30	1850	4	Own	4-4¾x7	GorK	3-4
Minne. Med.Duty	22-44	3300	4	Own	4-6x7	GorK	5-6
Minne. HeavyDuty	35-70	4600	4	Own	4-7½x9	GorK	8-9
Mohawk .1921	8-16	785	2	Light	4-3¼x4½	KorG,	1-2
Moline Univ D	9-18	990	2	Own	4-3½x5	Gas.	2-3
Moline Orch.	9-18	1075	2	Own	4-3½x5	Gas.	2-3
Motor Macult.	1½	195	2	Own	1-2¾x3½	Gas.	..
Motox	15-30	2250	4	Buda	4-4½x6	Gas.	3-4
NB.....1	3-6	425	4	Own	2-3¾x4	Gas.	¾
NB.....2	3-6	425	4	Own	2-2¾x4	Gas.	¾
Nichols-Shep. 20-42	20-42	3100	4	Own	8 x10	GorK	3-6
Nichols Shep. 25-50	25-50	3460	4	Own	9 x12	GorK	4-7
Nilson Jr....E	15-25	1775	4	Wauk	4-4¼x5¾	G or K	3
Nilson Senior	20-40	2475	5	Wauk	4-5 x6¼	G,K	4
Oil Pull....K	12-20	1485	4	Own	2-6 x8	K,D	3
Oil Pull.....H	16-30	2285	4	Own	2-7 x8½	K,D	4
Oil Pull.....G	20-40	3175	4	Own	2-8 x10	K,D	5-6
Oil Pull.....E	30-60	4590	4	Own	2-10x12	K,D	8-10
Oldsmar GarK	2½-5	395	4	Own	1-5½x5½	Gas.	2½
Oliver.....A	15-30	....	*2	Beav.	4-4½x6	GorK	3-4
Once Over Tiller Mark..6	12-25	3000	4	Strns	4-4½x6	Gas.	2
Parrett.....K	15-30	1950	4	Pitt	4-4½x6	G,K	3
Peoria.....L	12-25	1785	4	Clim.	4-5 x6½	G,K	3
Pioneer.....G	18-36	....	4	Own	4-5½x6	G,K,D	4
Pioneer.....C	30-60	....	4	Own	4-7 x8	Gas.	10
Planet Jr.....	5-10	950	2	LeRoi	4-3½x4½	Gas	1
Plowman....A	15-30	1995	4	Buda	4-4½x6	G,K	3-4
Port Huron..A	12-25	$1700	4	Chief	4-4¾x6	G,K	3
Prairie Dog..L	9-18	650	3	Wauk	4-3¾x5¼	Gas.	2
Prairie Dog..D	15-30	1250	4	Wauk	4-4½x6¼	Gas.	3
Ranger Cul. T-20	8-16	....	4	LeR.	4-3½x4½	Gas.	1
Reed.....A	15-30	1985	4	Wauk	4-4½x6¼	GorK	3-4
Reed.....A-1	18 36	2185	4	Wauk	4-5 x6¼	Gas.	4
Reliable	10-20	885	4	Own	2-6 x7	Ker.	2
Rex	12-25	1600	4	Wauk	4-4¼x5¾	GorK	3
Russell	12-24	1500	4	Own	4-4½x5¾	GorK	2-3
Russell	15-30	2200	4	Own	4-5 x6½	GorK	3-4
Russell	20-35	3000	4	Own	4-5½x7	GorK	4-5
Russell	30-60	5000	4	Own	4-8 x10	GorK	8-10
Samson....M	....	....	4	Nor	4-4 x5½	G,K	2
Sandusky ...J	10 20	1250	4	Own	4-4¼x5¼	G,K,D	2
Sandusky ...E	15-35	1750	4	Own	4-5 x6½	G,K,D	4
Shawnee Com.	6-12	....	2	LeR.	4-3⅛x4½	Gas.	10
Shawnee Com.	9-18	....	2	Gray	4-3½x5	....	..
Shelby.....D	15-30	....	4	Beav.	4-4¾x6	G,K	3
Shelby.....C	10-20	....	4	Erd.	4-4 x6	GorK	2-3
Short Turn.	20-40	1500	3	Beav.	4-4¾x6	G,K	3
Square T....A	18-35	2075	3	Clim.	4-5 x6½	K,G	3
Steady Pull.	12-24	1485	4	....	4-4 x5	Gas.	3
Stinson 4E	18-36	1835	4	Beav.	4-4¾x6	G,K	4
Stone	20-40	2250	4	Beav.	4-4¾x6	G,K	4
Tioga.....3	15-27	2625	4	Wisc.	4-4½x6	Gas.	3-4
Titan	10-20	900	4	Own	2-6½x8	G,K,D	3
Topp.....B	30-45	3500	4	Wauk	4-4¾x6¾	Gas.	3-4
Toro Cultivator	6-10	....	3	LeR.	4-3⅛x4½	Gas.	2
Townsend	10-20	895	2	Own	4-6½x7	Ker	2-3
Townsend	15-30	1485	2	Own	4-7 x8	Ker	3-4
Townsend	25-50	2750	2	Own	4-8½x10	Ker	4-8
Traction Motor	40-50	....	4	....	8-3¼x5	Gas.	4-5
Traylor....TB	6-12	715	4	LeR.	4-3⅛x4½	Gas.	1-2
Triumph....H	18-36	2450	2	Erd.	4-4¾x6	Ker.	4
Trundaar...10	25-40	3750	*2	Wauk	4-5 x6¼	G or K	4
Turner...1921	14-25	1295	4	Buda	4-4¼x5½	G,K	3
Twin City.....	12-20	1580	4	Own	4-4¼x6	G,K	3
Twin City.....	20-35	3175	4	Own	4-5½x6¾	G,K	5
Twin City.....	40-65	5250	4	Own	4-7¾x9	G,K	8
Uncle Sam C20	12-20	1385	4	Weid.	4-4 x5½	G	2-3
Uncle Sam B19	20-30	2300	4	Beav.	4-4¾x6	G or K	3-4
Uncle Sam D21	20-30	1985	4	Beav.	4-4¾x6	G or K	3-4
Universal	1-4	475	2	Own	1-3½x5	G	1
Utilitor....501	2½-4	380	4	Own	1-3½x4½	G	1
Velie...Biltwell	12-24	1750	4	Own	4-4½x5½	G,K,D	3
Victory...1921	9-18	1350	4	Gray.	4-3½x5	Gas.	2
Victory...1921	15-30	1750	4	Wauk	4-4½x5¾	Gas.	3
Vim.....B	15-30	1650	4	Wauk	4-4¾x5¾	G,K	3
Wallis.....K	15-25	1600	4	Own	4-4¼x5¾	G,K	3
Waterloo....N	12-25	1450	4	Own	2-6½x7	G,K	3
Webfoot....53	28-53	5000	*2	Wisc.	4-5¾x7	G,D	6
Wellington..B	12-22	900	4	Erd.	4-4 x6	Ker.	2-3
Wellington..F	16-30	1400	4	Chief	4-4¾x6	Ker.	3-4
Western. 1920	16-32	2100	4	Clim.	4-5x6½	Gas.	4
Wetmore	12-25	1650	4	Wauk	4-4 x5½	G,K	3
Wharton....E	12-20	1800	3	Buda	4-4¼x5½	Gas.	2
Whitney.....	9-18	....	4	Own	2-5½x6½	Gas.	2
Wichita.....T	15-30	2500	4	Beav.	4-4½x6	G,K,D	3
Wisconsin...E	16-30	2250	4	Clim.	4-5 x6½	GorK	3
Wisconsin...F	20-40	2450	4	Wauk	4-5 x6¼	GorK	4
Wisconsin...H	22-40	2800	4	Clim.	4-5½x7	GorK	4-6
Yuba...15-25	15-25	2945	*2	Wisc.	4-4¼x6	G,K,D	..
Yuba...25-40	25-40	4892	*2	Wisc	4-5¾x7	G,K,D	..
Zelle	12-25	....	4	....	4-4¼x5½	G or K	3

ABBREVIATIONS: G—Gasoline, K—Kerosene, D—Distillate. Plow capacity varies in relation to operating conditions. Figures are based on 14 in. plows. Engine Make; Beav.—Beaver, Clim.—Climax, Cont.—Continental, Dom.—Domas, Evin.—Evinrude, Herc.—Hercules, LeR.—LeRoi, Midw.—Midwest, Nway.—New Way, Nor.—Northway, Strns.—Stearns, T.C.—Twin City, Wauk.—Waukesha, Weid.—Weidely, Wis.—Wisconsin, *—Crawler type. All others are wheel type.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Ottawa, Ont.	Automobile Show	Sept. 9 to 17
Memphis	Tri-State Fair Automobile Show	Sept. 24-Oct. 1
Waterloo	Automobile Show	Sept. 26-Oct. 2
New York	Electrical Exposition	Sept. 28-Oct. 8
Peoria, Ill.	National Implement and Vehicle Show	Sept. 30-Oct. 8
Cincinnati	Fall Automobile Show	Oct. 1-8
Oakland, Calif.	International Traffic Officers' Ass'n	Oct. 24 to 29
Omaha	International Automobile Congress	Nov. 3-5
Olympia, England	Automobile Show	Nov. 3-12
Jersey City	Second Annual Show	Nov. 14-19
Chicago	Automotive Equipment Show	Nov. 14-19
New York	Automobile Show	Sept. 23-Oct. 2
Chicago	Automobile Salon	January, 1922
New York	National Automobile Show	Jan. 7-13, 1922
Chicago	National Automobile Show	Jan. 28-Feb. 3, 1922
Minneapolis	Tractor Show	Jan. 30 to Feb. 4, inclusive
Winnipeg, Canada	Canadian Automotive Equipment Ass'n Show	Feb. 6-11
Louisville, Ky.	Louisville Automobile Show	Feb. 20-25
Des Moines	Winter Automobile Show	Feb. 26-March 3

RACES

Fresno, Calif.	San Joaquin Valley Race	Oct. 1
Los Angeles	Speedway Race	Nov. 24

FOREIGN SHOWS

Buenos Aires, Argentina	Passenger Cars and Equipment	September
Luxemburg	Luxemburg Agricultural Sample Exhibition	September
Berlin	Automobile Salon	Sept. 23—Oct. 2
Paris, France	Paris Motor Show	Oct. 5-16
London	British Motor Show, Motor Mfgs. and Traders	Nov. 4-11
Paris	Aviation Exhibition	Nov. 12 to 27
Santiago, Cuba	Annual Automobile Show	March, 1922
Rio de Janeiro, Brazil	Automotive Exhibition	September, 1922

CONVENTIONS

Detroit	Credit Convention Motor and Accessory Manufacturers' Ass'n	Sept. 14-16
Chicago	Twenty-eighth Annual Convention National Implement & Vehicle Association	Oct. 12-14
Cleveland	National Tire Dealers' Association	November
New York	Service Managers Convention	Nov. 15-16
Columbus, O.	Ohio Automobile Trade Ass'n Meeting	Dec. 12, 13, 14

FORD BUYS TWO ACRES

Charleston, W. Va., Sept. 9—Henry Ford has purchased a tract of approximately two acres of land on the western edge of Huntington, W. Va., to be used as a site for a Ford assembling plant, to be constructed in the near future.

It is considered likely that the selection of Huntington as one of the cities where a large Ford assembly plant is to be erected will have material influence upon the proposed Symmes creek valley routing for the Detroit, Toledo & Ironton Railway, of which Mr. Ford is the guiding hand and principal owner.

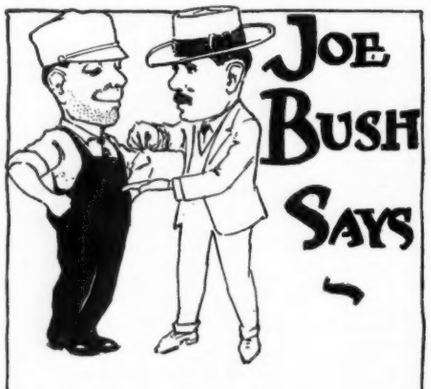
HARDING AT BIRMINGHAM SHOW

Birmingham, Ala., Sept. 9—Applications are being received in large numbers for the Birmingham Automobile Show, to be held during the celebration of the city's fiftieth anniversary, Oct. 24 to 30. F. W. Brownell has been named chairman of the committee to promote the show.

No restriction will be placed upon any car entry into the show except that it be handled by a local dealer. A street will be closed for a block and the show will be held in this space on account of lack of a large display place. Covers will be provided and protection of every kind given the cars.

President Harding will be a guest of the city and will visit the automobile show during his stay.

Manufacturers or others who desire space reservations are urged to communicate with Brownell at Brownell Auto Co. as soon as possible.



REMEMBER, some one, somewhere in the organization has to pay for the broken drill or drop light.

Canada Makes Report on Service Station Growth

Ottawa, Ont., Sept. 9—The Dominion Bureau of Statistics has just published its first preliminary report devoted to repair work of the different industries in the Dominion, this report covering the year 1919.

The number of firms engaged in automobile repairing was 1239, the number of employees was 3629 and they received $3,728,414 in wages.

Repair parts, made by automobile manufacturers used in repair work, were valued at $4,375,085, while the total cost of repairs to the public was $11,991,020. Ontario's share of the work was $5,589,420; Saskatchewan's, $1,446,597; Quebec's, $1,422,389; Alberta's, $1247,459; British Columbia's, $873,260; Manitoba's, $820,736; Nova Scotia's, $402,462; New Brunswick's, $185,373, and Prince Edward Island's share $3324.

Bicycle repairs, including motorcycles, totalled $532,584, the work being divided among 136 establishments. Materials used cost $156,350, wages paid to the 205 employees amounting to $174,181.

THREE REASONS FOR ACCESSORIES

San Francisco, Sept. 10—When potential car buyers are hanging onto their old automobiles it is a good time to sell them accessories, for then these owners are trying to maintain their cars in as presentable a condition as possible, and also to keep them serviceable.

When new cars are selling well, when the owner is willing to sell his old car and buy a new one, then also is the time to sell accessories, because the car owner is in a buying mood and is anxious to get anything that will make his investment more satisfactory.

Thus, accessories so equalize the car dealer's business that he is doing something with them all the time.

This, in three sentences, is the reason that the automobile dealer should always handle a full line of accessories, according to A. R. Arnot, president of the Hassler Pacific Co., makers of shock absorbers.

SAFETY EXPERTS TO MEET

Oakland, Calif., Sept. 10—Several hundred automotive safety experts from all parts of the United States and Canada will attend the annual convention of the International Traffic Officers' Assn. here Oct. 24 to 29, according to J. H. Nedderman, secretary of the organization. Special attention will be paid to motorized fire, police and sanitary departments.